

Machine and Tool **BLUE BOOK**

ESTABLISHED 1906

AUGUST 1951

Special report on Lathes . . . part 2

Clamping irregular pieces

Automatic riveting

How's Business?

Last Minute Washington News

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"MARVEL"...

*Has
Always
Had
The*
EDGE




MARVEL High-Speed-Edge Blades assure Faster, more Accurate cutting with proven Economy and complete Safety. Only the MARVEL is a composite blade with a high speed steel cutting edge electrically welded to an exceptionally tough, strong steel body.

The High-Speed-Edge does the cutting while the alloy back with hardened eyes, carries the load. Blade tensions up to 300% higher than those possible with ordinary blades are recommended. This greater tension is confined to the cutting or leading edge by the location of pin hole (exclusive MARVEL design feature) and cannot be overcome by work resistance. Heavier feeds and greater speeds are practical without "run out."

With greater accuracy, higher production and lower cost per cut, come the extra dividend of Safety, for MARVEL High-Speed-Edge Hack Saw Blades are Positively Unbreakable — **they will not shatter.**

Ask your local MARVEL distributor (see classified phone book) to help you modernize your metal sawing with Marvel High-Speed-Edge Blades. They cost no more than ordinary high speed steel blades.



High-Speed-Steel
cutting edge.

Tough unbreakable alloy steel body with hardened eyes.

Integrally welded to make a fast-cutting, long lasting composite blade that is **positively unbreakable.**

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"The Hack Saw People"

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LOW COST

**methods for
PERFORATING
and NOTCHING
SHEET METALS**

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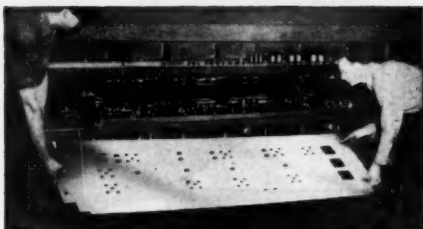
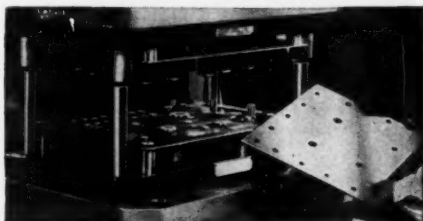
at work in large inclinable press. Magnetized units hold the retainers. No bolting required. A fast, economical method in making up a punch and die set for short or long runs. All parts re-usable.

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on $\frac{1}{8}$ " steel perforating and notching job, using Tee slotted die set. With Whistler Punch and Die units production starts within hours instead of weeks. Last minute job changes made quickly.

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August, 1951



Wade

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"The Tool Holder People"
5208 W. ARMSTRONG AVENUE CHICAGO 30, ILL.

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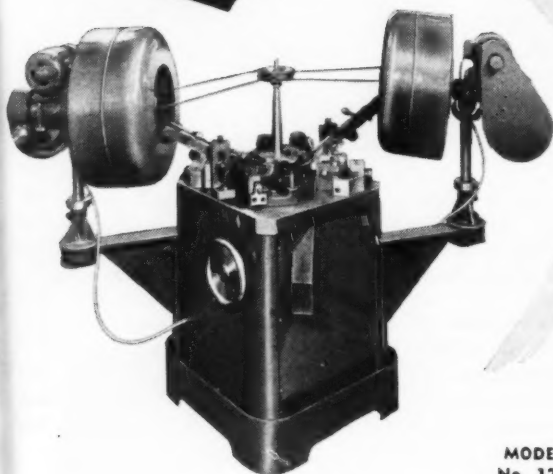
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No. 125

PLANETARY THREAD ROLLING MACHINE

PRODUCTION..... 25,000 Threaded parts per hour
TOLERANCE..... Class 3
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CAPACITY..... $\frac{1}{4}$ "x2" Threads.

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INFORMATION available on this machine and on the #200 ROLL-MASTER Planetary Thread Rolling Machine for threads $\frac{1}{2}$ "x3"

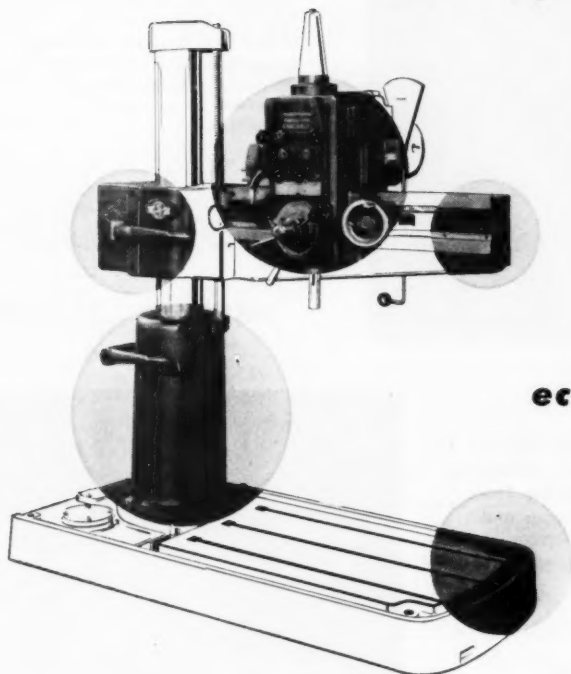
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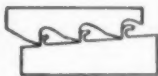
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Grinding long bars on a CINCINNATI Centerless. These efficient, precision grinding machines are available in No. 2, 3, and 4 sizes, for infeed and thrufeed grinding, capacity up to 9" in diameter. May be tooled up for small quantities or automatic production.



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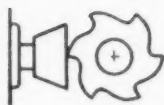
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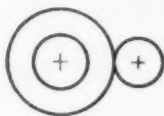
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CINCINNATI GRINDERS INCORPORATED
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CINNATI



**FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID
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for better production*

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You reduce set-up time when you use Benco Master Collets as the pads are quickly changed without removing the collet from the spindle. As a result, your machines turn out more and better work, regardless of the type of stock.

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Benco Master Collets grip tighter, run true and work faster—their concentricity is assured through precision manufacturing and rigid inspection. Insist on Benco Collets and watch production figures go up and rejects go down.

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Equip your machines with Benco Master Pushers and get extra output at lower costs.



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Always Better Constructed
Accurate Benco Collets, Pushers and Pads

Now

automatic duplicating

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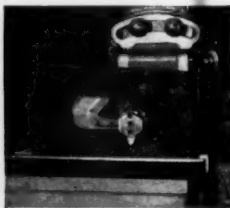
Dies from templates



Facing 90° shoulders



Interchangeable molds



Duplicating internal contours

...ON A CINCINNATI SHAPER

You can duplicate parts on a versatile Cincinnati Shaper with a single point tool, using actual parts or simple sheet metal templates—at new speeds and new low costs.

This automatic duplicating device has a wide application in the tool and die field—and also produces a very large variety of parts in the general shaping field. We illustrate some of these shapes accurately produced at low costs with single point tools.

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A Cincinnati Shaper with automatic duplicating device can save you time and money in your shop.

Write for Automatic Contour Duplicating Bulletin DN-1.

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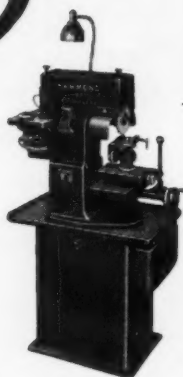


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TOOLS**

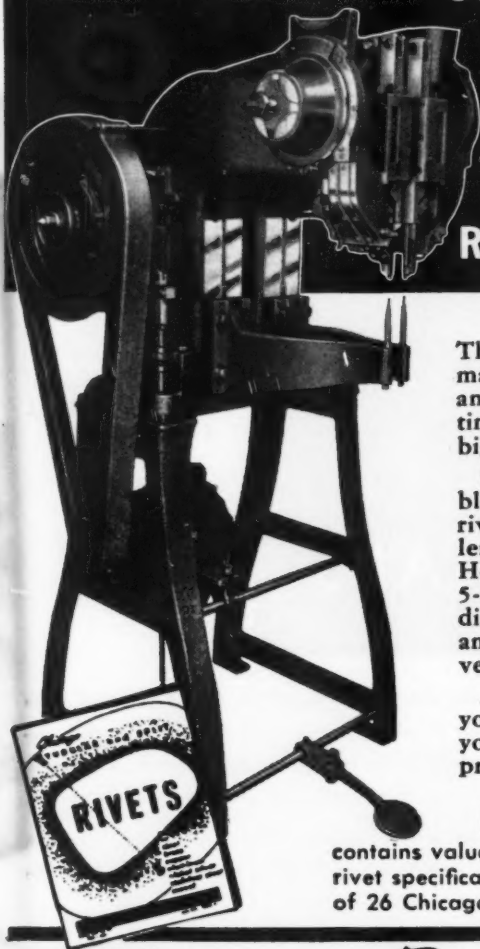
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with the

Chicago
"214" DOUBLE
RIVET SETTER



The "214" automatically feeds, inserts and clinches two rivets at a time...with speed that may mean a big saving in your fastening costs.

14" throat makes large assemblies easy to handle. For tubular rivets as large as $\frac{3}{4}$ " or less in length. Quick Change Rotary Type Hoppers and Raceways permit a 5-minute changeover to rivets of different size. Adjustable anvils and riveting centers add to its versatility.

Ask us how the "214" can help you cut costs. Send a sample of your problem assembly (or blueprint) for a Free fastening analysis.

FREE CATALOG

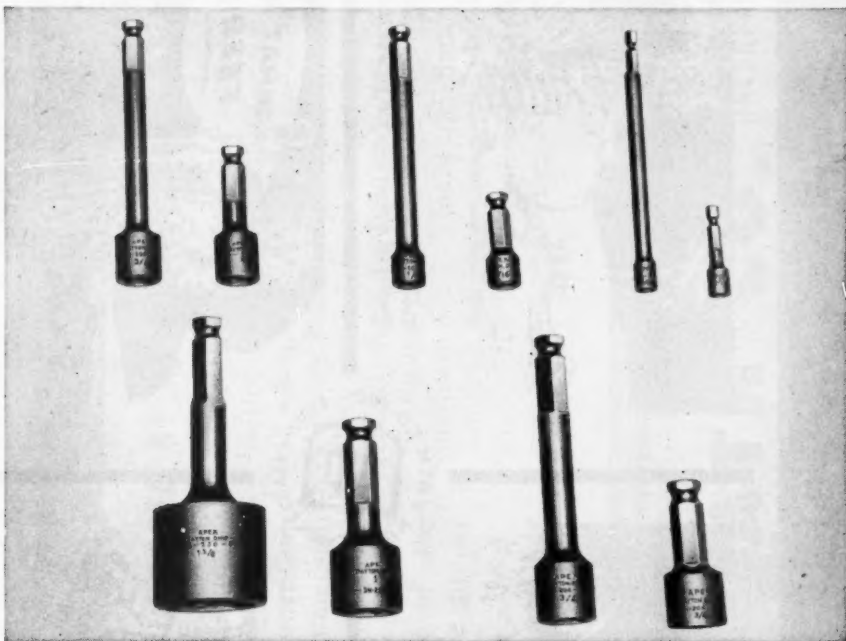
contains valuable engineering information and rivet specifications plus illustrated descriptions of 26 Chicago Automatic Rivet Setters.

Chicago Rivet & MACHINE CO.

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For increased torque...specify **APEX SN NUT SETTERS**



Power—applied straight from gun to work—that's the way Apex SN nut setters develop greater torque . . . permit faster, safer operation . . . help lower production costs.

These precision-built, one-piece tools have no movable parts, joints or locking devices to cause excessive torque loss, backlash or vibration. Easier on tools and operators.

Apex SN Series nut setters are available with $\frac{1}{4}$ " $\frac{3}{16}$ " $\frac{1}{8}$ " $\frac{3}{8}$ " and $\frac{3}{4}$ " hex drives . . . broached hex openings, $\frac{1}{4}$ " to $1\frac{1}{4}$ " . . . broached square openings, $\frac{1}{4}$ " to $\frac{3}{4}$ ". Complete information on Apex SN nut setters and other money-saving Apex production tools is available in Catalog 29. Write, on your company letterhead please, for your copy.

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for Phillips Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal Joint Socket Wrenches.



A big game hunter — sadly enough
Used a faulty old gun to do his stuff.



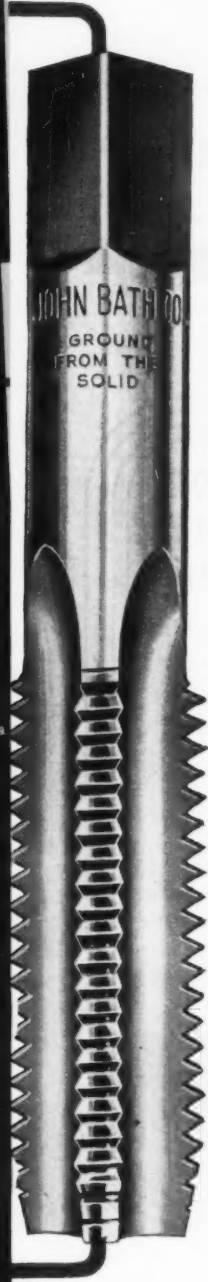
The hunter took aim, but his shot went wide!
He stuffed a tiger . . . but he was inside!



Inaccurate taps put your work "on the Fritz".
You'll get plenty of rejects from improper fits!



So — insist on Bath Taps . . . you'll get accurate feed,
With uniform measure of pitch, angle and lead.



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In the manufacture of Bath ground thread taps, particular attention is given to the accuracy of dimensions such as pitch diameter. This dimension is most important, since it controls the size of the tapped hole (provided the major and minor diameters of the thread are such as to insure proper clearance).

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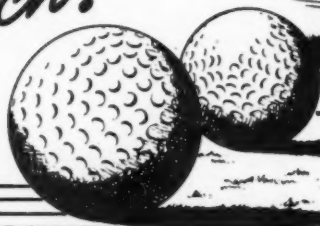
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fraction of
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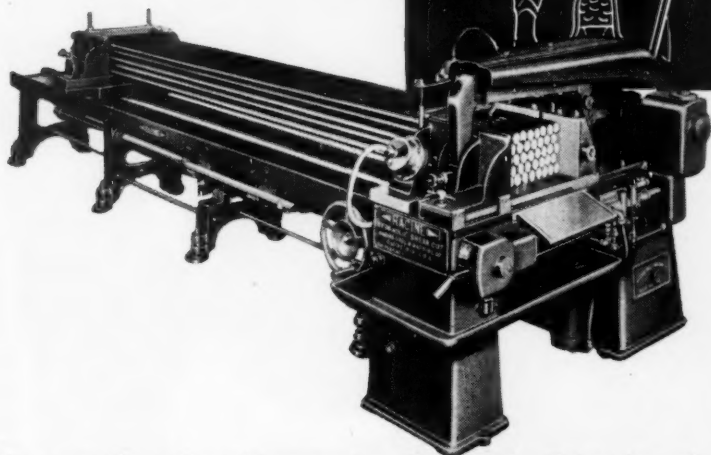
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Mfg. of Micrometer Dial Gauges • Micrometer Dial Indicators

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SHOULD BE RETIRED**



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Stock wasted by inaccurate cutting—subsequent excessive machining time—short blade life—less cuts per hour, build costs that soon offset the price of a new power saw.

These costs, often unnoted, are eliminated when you use late model RACINE Hydraulic Machines. Capacities — 6" x 6" to 20" x 20" Single purpose and automatic bar feed units.

Write for Free written production estimate sheets. Simply describe your work and needs. Address RACINE TOOL and MACHINE CO., 1754 State St., Racine, Wis.

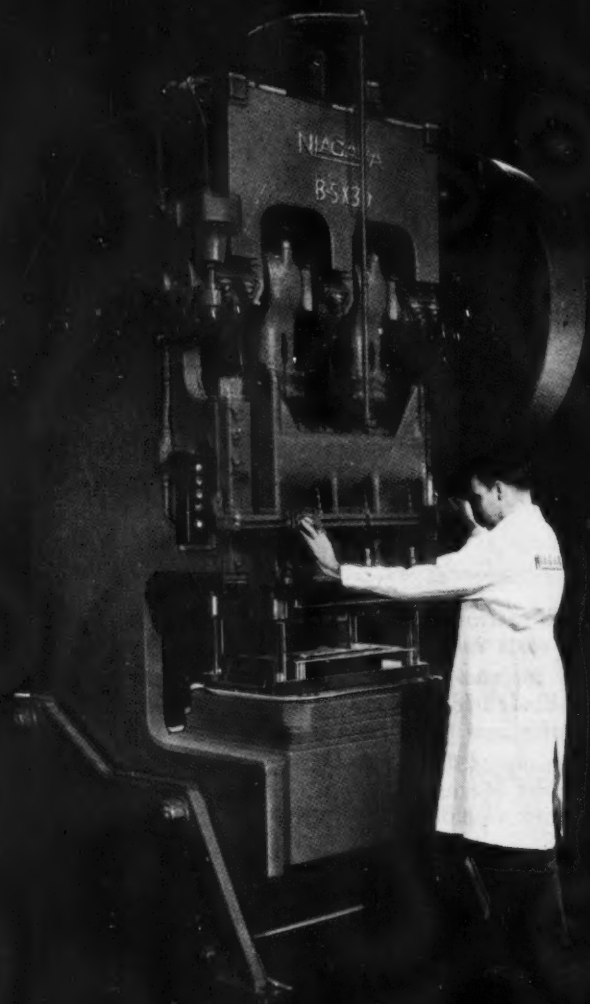


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STANDARD
for QUALITY
and PRECISION

NIAGARA

FOR DEFENSE PRODUCTION



Niagara No. B1-5x30 Gap Frame Double Crank Inclined Press fitted with magnetic perforating dies made by S. B. Whistler & Sons, Inc., Buffalo, N. Y. Press equipped with air actuated electrically controlled sleeve clutch.

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NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

PRESENTS

No. BI-5x30 Double Crank Gap Frame Inclined Press with one-piece welded steel frame

- Gives full support to wide dies, impossible to obtain on the conventional single point Inclined Press even with slide flanged out.
- Gibbing may be brought closer to point of load application on this double crank press than with flanged slide single crank design.
- Two point suspension resists tendency of slide to tilt under off-center loading conditions.
- Niagara gap frame construction gives equal access to all four sides of die. No ribs or shafts extending across the back of press.
- Inclined position permits finished work to drop off the rear of the press.
- Gearing enclosed and running in oil.
- Backshaft mounted on anti-friction bearings.
- Air counterbalance for slide.
- Bronze bushed main and connection bearings.
- Niagara electrically controlled air actuated sleeve clutch.
- Air releasing brake.

Similar presses are made in sizes ranging from 3½" to 6½" diameter shaft. Sizes 3½" and 4" are made with mechanically operated sleeve clutch.

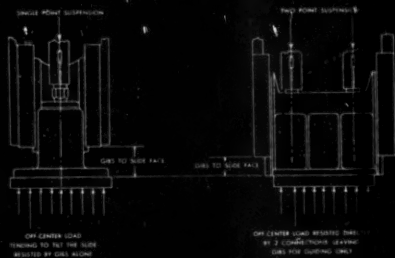


Illustration shows Niagara No. BI-5x30 press in inclined position.

Manufacturers of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work
DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

Tool Saving Tips

#3 OF A SERIES

**USE
KENNAMETAL
MECHANICALLY
HELD TOOLS**

SAVE STEEL

Solid heat-treated shank resists chip erosion—serves as permanent tool holder

SAVE INVESTMENT

Tool is suitable for cutting variety of metals, by using insert of proper Kennametal grade

SAVE GRINDING WHEELS

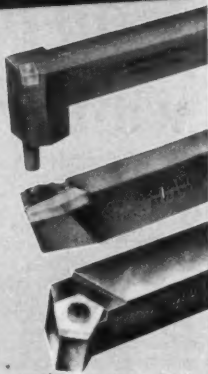
Grinding is simpler—less frequently required. No steel to grind

SAVE CARBIDE

Mechanical-holding prevents brazing strains—insures best service from Kennametal

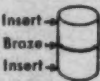
SAVE "CRITICALS"

The mechanically-held technique enables you to get the best possible service from all tooling elements, thereby conserving materials, machine-time, and man-hours



HOW TO S-Y-R-E-T-C-H KENNAMATIC INSERTS

When Kennametal inserts have been re-ground many times and have become too short for effective clamping, simply braze two "used" pieces end to end as shown. This permits proper clamping . . . and because Kennametal inserts are uniformly sound from insert top to bottom you get much more work from each insert.



The ruggedness, strain-free assembly, and convenience of mechanically-held Kennametal tools enable them to do many jobs that brazed tools cannot do . . . or to do them faster at less cost.

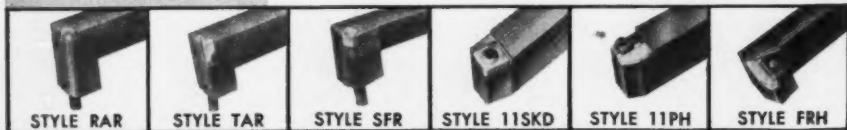
Standard Kennametal tools will handle the majority of these jobs . . . and the basic principles of their design are adaptable to a wide variety of special purpose clamped tools which can be made in your own shop. To assist you we have published a "Clamped Tool Design Manual." Write for a free copy.

Our nearest field engineer can help you use clamped tools most effectively. He represents our organization which pioneered the mechanically-held principle . . . offers you the greatest accumulation of tool-and-time-saving "know-how" available through one source.



KENNAMETAL Inc., Latrobe, Pa.

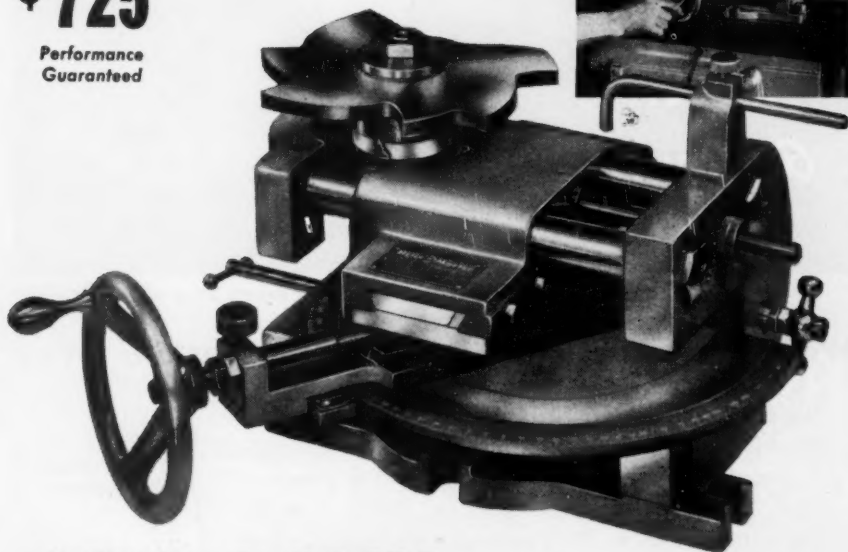
MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES
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Guaranteed



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COLLET COMPANY

PRODUCTION

Goes UP...

REJECTS

Go DOWN...



Hi-Speed rotary filing of metal pattern

When Patterns are Finished the Haskins Way

When you file and finish metal patterns with Haskins Flexible shaft equipment, you get the precision craftsmanship that assures quality production. Designed to speed pattern, die and mold finishing, Haskins HS-4 equipment— $\frac{1}{2}$ h.p.—has a six-speed, Timken-bearing countershaft that develops up to 7800 r.p.m. Available with bench, pedestal or overhead mounting. The Haskins complete line of machines and attachments gives you the right combination for all grinding, sanding, filing, or polishing operations. Write today for complete information. R. G. Haskins Co., 2645 W. Harrison St., Chicago 12, Ill.



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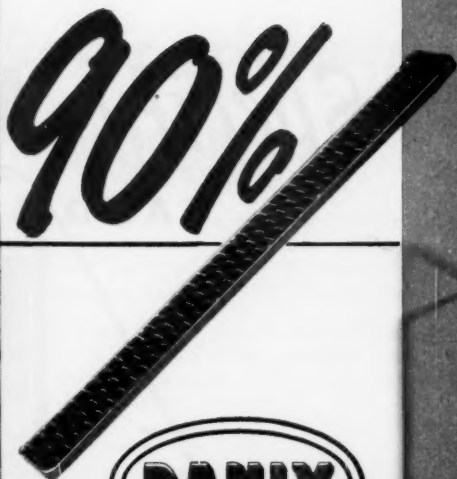
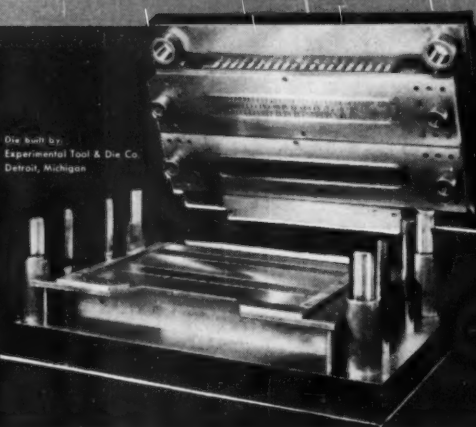
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Diemakers at Experimental Tool & Die Company solved a costly repair soldering problem on these stamped radiator heads with the die shown below. Precision was the secret. Die tolerances were held to within .0001" and all die components had to be interchangeable. That's why they specified . . .

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Experimental Tool & Die Co.
Detroit, Michigan



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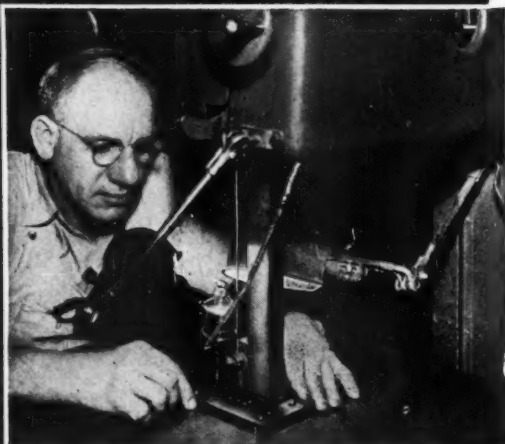
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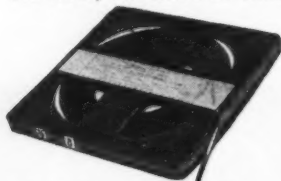
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For Smoother

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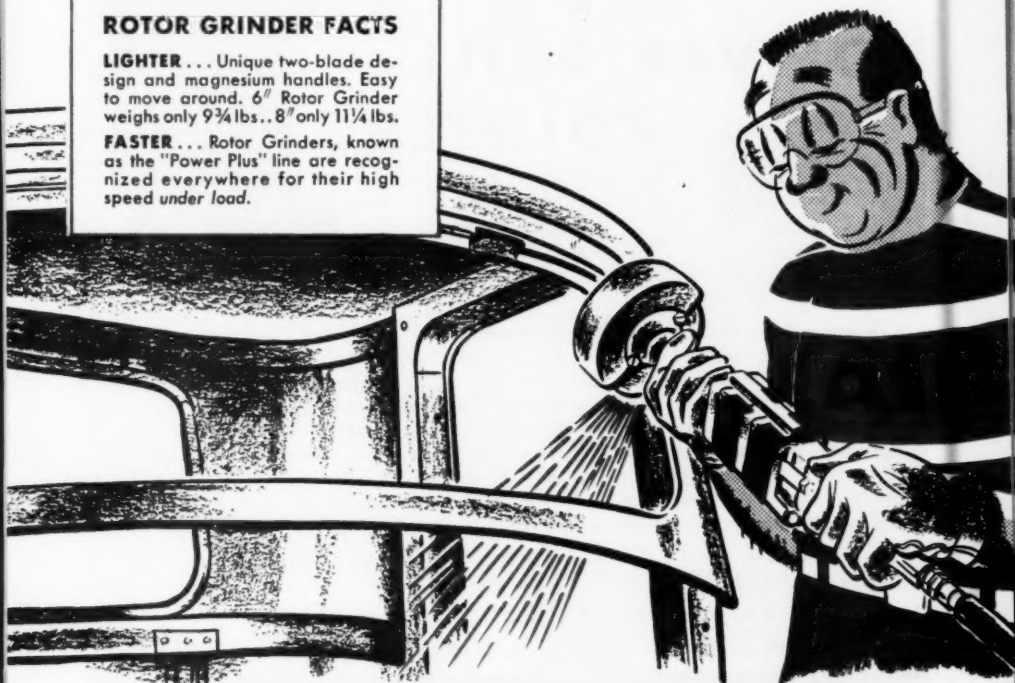
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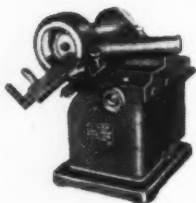
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Use **OLIVER DRILL POINTERS**



There are so many variable operations in drilling and many types of conditions to be met. They all depend on the essentially required use of correctly sharpened drills to obtain the best results. Twist drills should be removed from the drilling machine and replaced at the first sign of dullness. Prompt attention to this condition increases their wearing life, plus the method that has been proven best for sharpening drills—machine grinding. Oliver Drill Pointers have proved their efficiency and economy through years of constant use. They give more accuracy . . . more perfect holes and longer drill life . . . BE WISE, OLIVERize.

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The No. 510 Oliver for drills $\frac{1}{4}$ " to 3" — 2-3-4 flute.

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& TAPPING MACHINES



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Two different jobs use the same fixtures --

500 MORE PARTS EVERY HOUR



Webster-Chicago Speeds Production with

MULTIPRESS[®]

In addition to raising production from 200 to 700 units per hour — $3\frac{1}{2}$ times faster — this Multipress handles two completely different parts without any change whatsoever in fixtures and dies.

One part is handled by the day shift; the other by the night shift, producing an equal number of the two parts which fit together in one of the high-precision three-speed Webster-Chicago record changers.

The operation stakes upright metal pins to stamped plates — two pins in one part, three in the other — and pins in the two parts are entirely different in spacing. The four-ton Multipress is

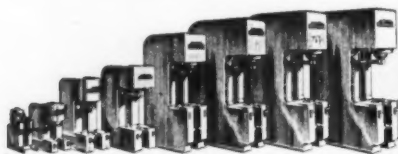
equipped with a six-station indexing table tooled three stations. Ram tooling consists of a multiple-punch head with a spring stripper. Bottom dies are also spring loaded, and equipped with guide pins that prevent either of the parts from being loaded incorrectly. The operator simply drops the required number of pins in place and positions the plates on the fixtures.

All punches descend with each ram stroke, but only three contact pins in the first of the two plates, and only two in the second plate. For extra safety, a Plexiglas shield covers the entire front of the ram area, and a microswitch arrangement shuts

the press off instantly if a fixture is not correctly loaded.

A counting device attached to the head of the press is operated by an arm which strikes the tooling as it indexes to the ram station. The air-blast ejector operates in a similar manner.

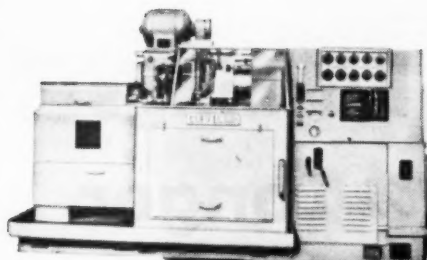
The fast, smooth, accuracy of oil-hydraulic action is *made-to-measure* in Multipress for hundreds of different production jobs where more speed, precision, quality, safety and economy are desired. Eight Multipress frame sizes offer capacities from one to 50 tons. Many standard accessories for special needs. Write for the complete Multipress story!



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HydrOILics



all kinds of parts ... from
a variety of materials ...
fast, accurate, at low cost

Model AB 2½" Single Spindle Automatic

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CLEVELAND**



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Close tolerances. From
SAE 5120 hot rolled
steel.



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From free machining
brass. Fine finish im-
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DIE CASTING INSERT
Requires exception-
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SAE 1112 cold rolled
steel.

SHOWN here are a few samples of *profitable* production being turned out by prominent, cost-conscious manufacturers on new Dialmatic Clevelands.

The Model AB Dialmatic Cleveland is fast and accurate, rigid and powerful. Just consider this: Here, in one machine having a 2½" bar capacity, is a spindle speed range that permits you to thread 2½" diam. alloy steel down as low as 16 sfm—or work ⅝" free machining brass at 416 sfm! 112 spindle speed selections are available.

And set-up time is *short!* Electric Feed Drive operates all five turret tools (a 6-hole turret is supplied when required). Forward and return turret tool feeds are simply set by positioning dials on the control panel. Double cross slides operate by standard cams mounted on adjustable drums.

More versatile than any other automatic, the Model AB Cleveland is quickly and easily *converted to a chucker*—ideal for shops having an occasional chucking job to run in addition to their bar work.

Why don't you find out *now* if the new Dialmatic Cleveland can cut the cost of your production? Ask Camco engineers to submit a direct proposal with production estimates on your work. For complete machine specifications, write for bulletins.

The Cleveland Automatic Machine Co. manufactures and stocks a complete line of **STANDARD TOOLING AND COLLETS** for use with Cleveland Automatics. Prompt deliveries. Write for complete information.



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Write for catalog, price list and other information needed by the tool engineer.

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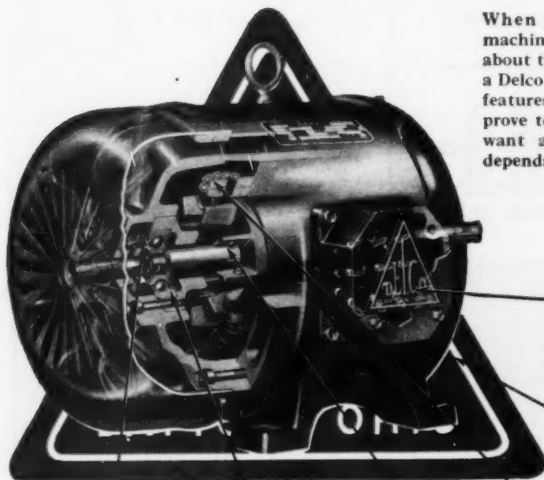
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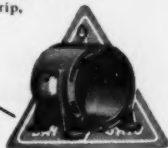
Here's the "INSIDE STORY" on DELCO MOTORS



When you invest in new production machinery, it pays to be just as particular about the motor that drives it. Look inside a Delco Motor. You'll see extra engineering features, extra care in construction, that prove to you a Delco is built the way you want a motor built. Specify Delco for dependable power day in, day out.



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Protects against drip, splash



CORROSIVE-RESISTANT CAST IRON FRAME
More solid, more rugged



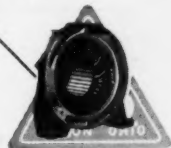
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How to expand your plant's production without extra construction or manpower!

WARNER & SWASEY's new CAMLESS 5-Spindle Automatics have expanded greatly the productive capacity of Alloy Steel Products Company. Previously, production of their stainless steel valves for the chemical and oil industries, limited to short runs, had been done profitably on hand machines.

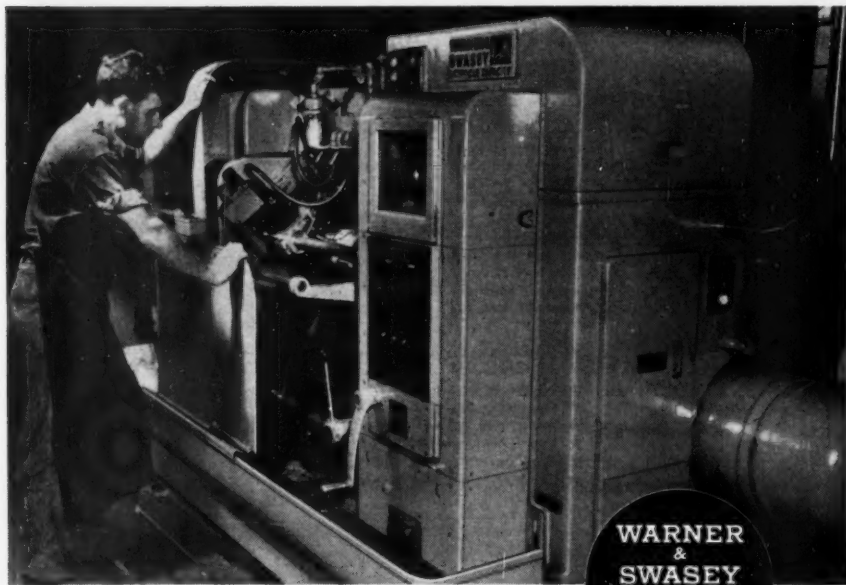
But increased production required building space for more machines as well as hiring more operators. Their only other choice was to consider new production methods.

Alloy Steel made their choice—Warner & Swasey Camless 5-Spindle Automatics.

Ideally suited for short and medium runs, these new automatic machines now handle *profitably* 69 different jobs in lots from 200 to 500. Volume—better in quality and finish—has stepped-up 50% in allover average. No investment in cams is needed!

And—particularly important in today's tight manpower market—more work can be done with fewer operators.

If you are faced with production schedules that apparently require additional construction and manpower, call in your nearest Warner & Swasey Field Representative. He'll be glad to show you just how a Warner & Swasey Automatic can help.



Warner & Swasey CAMLESS 5-Spindle Automatic at
ALLOY STEEL PRODUCTS CO., Linden, New Jersey.

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Cleveland
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YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

**SIX SPINDLE
PRE-SELECTIVE SPINDLE SPEEDS
TURRET TYPE AUTOMATIC INDEXING
DRILLING AND TAPPING MACHINE**

... gives you

**6 MACHINES
IN ONE**

THE NEW No. 2 MODEL A

Burgmaster

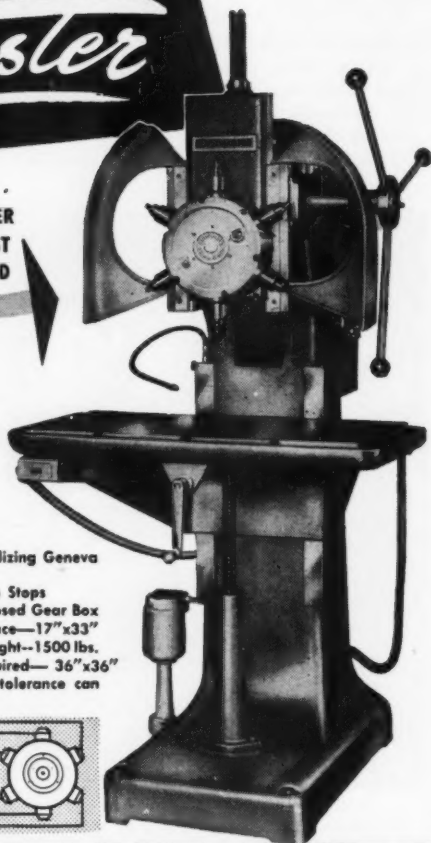
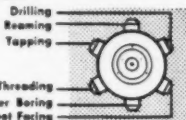
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**HIGHER PRODUCTION WITH GREATER
ACCURACY AT LOWER COST
PER PIECE MACHINED**

The No. 2 Model A BURGMASER will definitely cut your second operation costs because: Loss of time due to movements of parts from one spindle to another are eliminated; Close tolerances on size and concentricity are easily maintained; Set-up is simple and fast—unskilled operators can run the machine; Less floor space and power required; Rigidity, power and spindle speeds permit the use of high cutting speeds; Fixture costs can be reduced—fixtures can be materially simplified; All this means more parts per hour—per man, at less cost to you.

- ★ ½" Drill Capacity
- ★ ½" Tap Capacity
- ★ 1 to 2 H.P., 2 speed, 3 phase, 60 cycle Motor
- ★ 12 Spindle Speeds, ranging from 225-3000 R.P.M.
- ★ 4 Speeds, pre-selective per spindle, at any one setting
- ★ 8" Ram Feed
- ★ 19" Table Travel
- ★ Throat Depth—11-5/16"
- ★ Spindles Mounted on Class "O" Timken Bearings

- ★ Power Index, utilizing Geneva Mechanism
- ★ Individual Depth Stops
- ★ Completely Enclosed Gear Box
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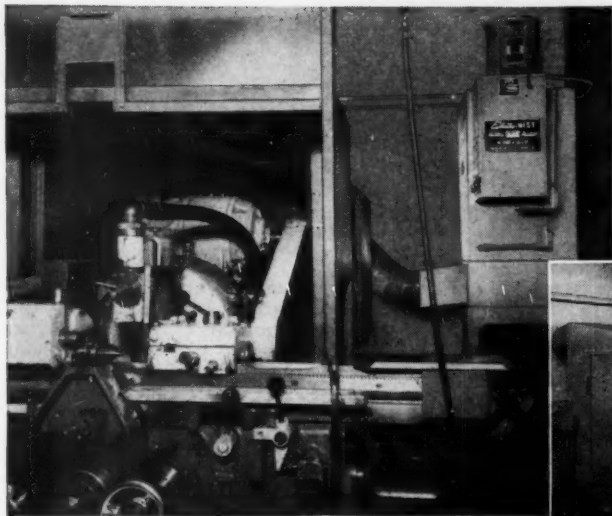


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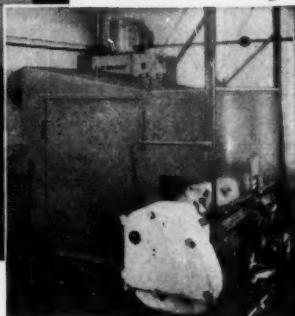
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The hazards created by coolants and the nuisance of oil mist and smoke from high speed grinding and cutting operations are completely controlled by AAF's Electro-Mist collector. A self-contained unit designed specifically for this purpose, the Electro-Mist exhausts material at the source by combining heavy duty industrial filters with electronic precipitation. Its unique design allows easy removal of collector plate assemblies, as well as access to all parts . . . without tools . . . thus reducing maintenance to a minimum.

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If you are interested in safer, cleaner *high speed* grinding and cutting operations call your AAF representative today or write for complete details on Electro-Mist contained in AAF Engineering Bulletin No. 251.



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3 SIZES TO MEET YOUR REQUIREMENTS



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On the left, the Kalamazoo 816-C (coolant model) takes up to 8" rounds, tubes, pipe; up to 8" x 16" bars and angles. Cuts them fast, smooth, accurately—with no burr, minimum kerf. Also available as Kalamazoo 824 standard or coolant models with 8" round capacity and 8" x 24" flat capacity.

On the right, Kalamazoo Model 610-S—fast, rugged, and accurate, with a host of exclusive features for finer performance. Takes rounds, tubes, and pipe up to 6" diameter, bars and angles up to 6" x 10". Outstanding low-cost saw on the market. Uses any standard motor $\frac{1}{3}$ HP, 110/60/1. Same capacity with coolant equipment as Model 610-C. Write today for complete information on any model.



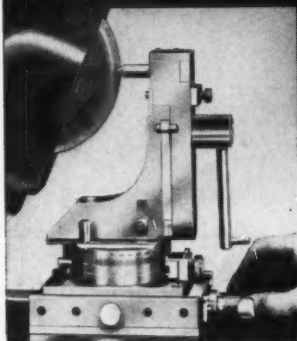
MACHINE TOOL DIV. *Kalamazoo* TANK and SILO CO.

821 HARRISON ST., KALAMAZOO, MICHIGAN

More Production per Man Hour

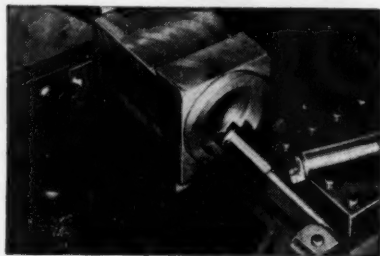
with Machine Shop TIME SAVERS

by **J & S**

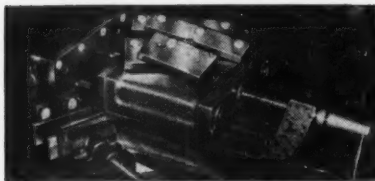


J & S "Fluidmotion" RADII and ANGLE DRESSERS dress entire angle-radius-angle profile in one continuous motion—with one easy set-up! Automatic centering, dustproof and chatterless, high-carbon, high-chrome steel construction. Dresses wheels up to 20" diameter—easily adaptable to all surface and cylindrical grinders, with J & S fixtures.

J & S KOALA "Circular" CUTTING TOOLS. New or re-sharpened cutters inserted in same shank without re-setting machine or stops—each accurately repeats original set-up position! Easy to re-grind, low-priced, simple. Major uses: Internal—boring, facing, threading, forming; External—turning, facing, forming, threading. Photo shows typical deep boring, boring and internal facing operation, external facing and turning. 12" Boring Bar removed to show carbide head after numerous re-grinds.



J & S "Down-Hold" VISE JAWS and "Attachable" PARALLELS, used with regular vises, save 25% to 75% on loading time! **VISE JAWS** force work-piece down—"stops" provide accurate position. Eliminate hammering, feeler gauges, allow repetitive operation. **PARALLELS** snap into place, are forced down so chips can't get under them. Eliminate wiping vise and parallels after each operation. Both Vise Jaws and Parallels easily attached to any type and size machine vise.



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Identification **ROLLED** into your products will help you market them.

Hack Saw blade above has been permanently marked in a Model 175 Hydraulic Marking Machine using a solid engraved lettering knurl.

Your name, model number, part number, serial number or decorative designs can be rolled into your components to improve their appearance and facilitate identification. Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

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OF COURSE this picture is a long way from machine shop practice. The point is—

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Design, construction and workmanship insure uniform operating characteristics, reduce delays due to tool failure and result in fast, economical production. For sale coast to coast by leading Industrial Supply Distributors.



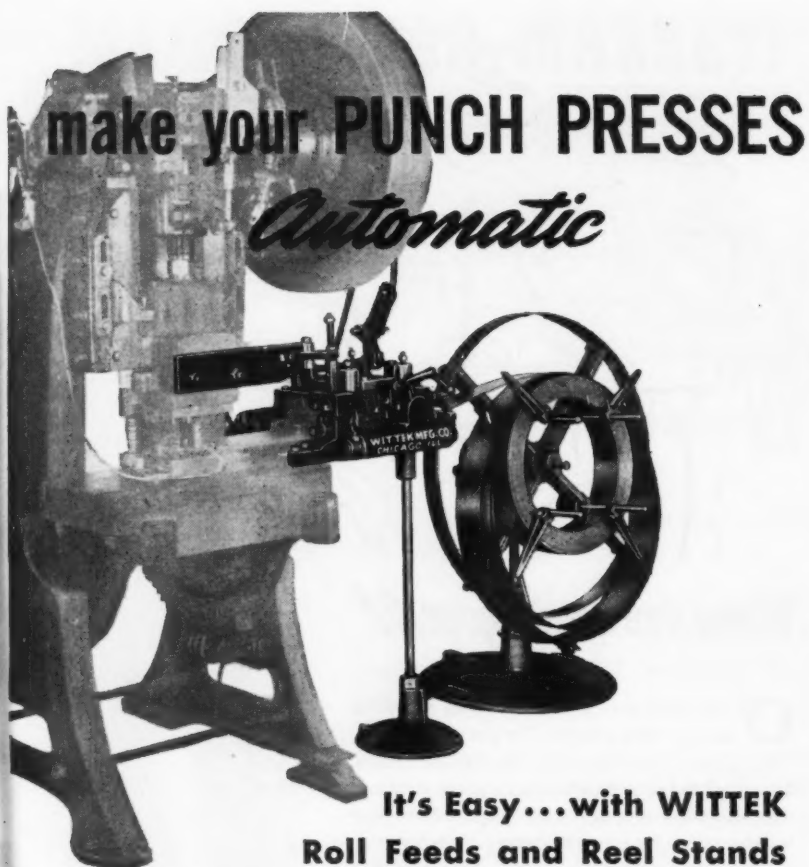
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Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

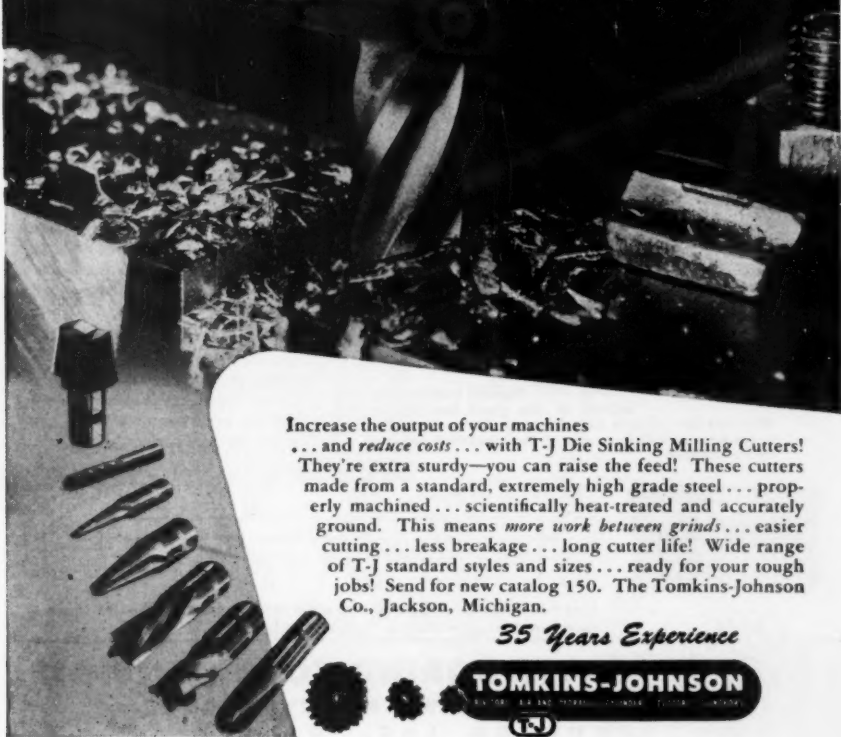
Wittek Reel Stands facilitate handling coiled stock.

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Increase the output of your machines
... and *reduce costs* ... with T-J Die Sinking Milling Cutters!
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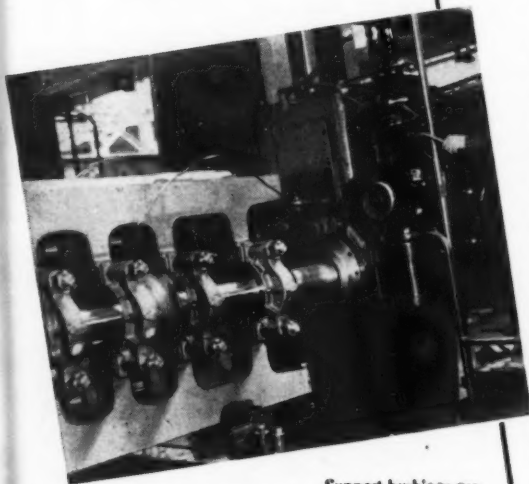
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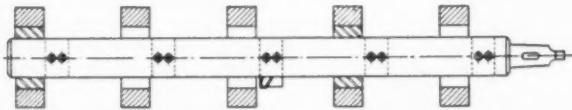
(TJ)

DAVIS BORING TOOL

REDUCES CRANKSHAFT
BEARING REPLACEMENT TIME
IN DIESEL ENGINES



Support bushings are placed in two good bearings to align the bar. Simple adjustment of micrometer cutter determines correct bore size of the crankshaft bearing being repaired.



Line boring bar showing position of cutter ready to bore bearing. Micrometer adjustable cutter block is illustrated at left.

Easy Adjustment of
Micrometer Cutter Block in Line Bar
Simplifies Precision Boring Operation
...Method Used Assures Alignment

● "Out-of-service time" because of bearing replacement or repair in Diesel engines is materially reduced by using Davis line boring bars equipped with micrometer adjustable cutter blocks. Simple setting of the micrometer screw adjusts the cutter to the desired bore diameter. There is no "cut and try" necessary to size the bore nor is there danger of misalignment.

The boring method is unusually simple. Precision bushings are placed in the sound bearings nearest the damaged bearing. These support the boring bar and assure positive alignment. The cutter block is easily inserted in the bar slot and set to required bore dimensions. The operation is then rapidly completed.

Whatever your standard or special boring requirements are, either in building or repairing Diesel engines, it is profitable to call on experienced Davis engineers for recommendations.



DAVIS BORING TOOL DIVISION
GIDDINGS & LEWIS MACHINE TOOL CO.
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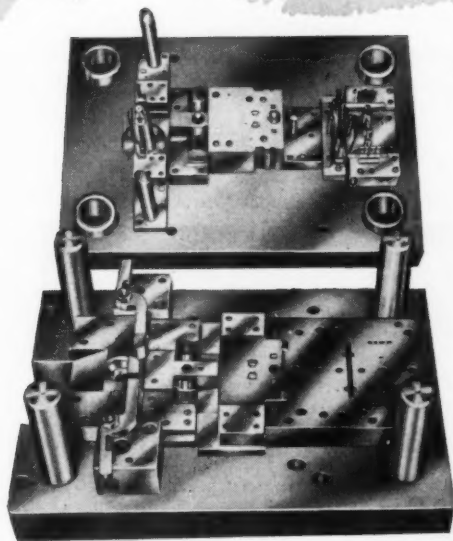
BREAKAGE !

EXCESSIVE BURRS !

CHIPPING !

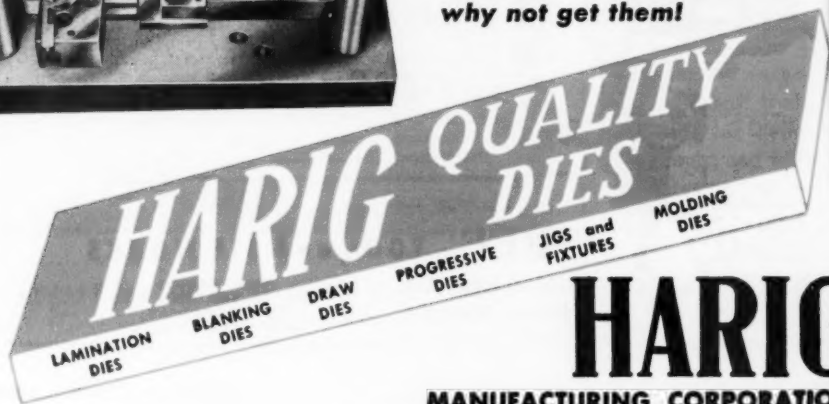
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WITH THE

TREE

TAPER BORING TOOL

Cut expensive set-up time from hours to a few minutes with the revolutionary TREE taper boring tool. You can use it on your present milling machine, jig borer or boring bar. Write today for complete information. In addition to boring taper holes this tool can be used for —



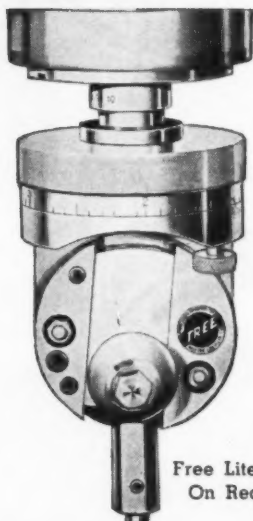
- Straight boring . . . as shown at left used as offset boring tool.



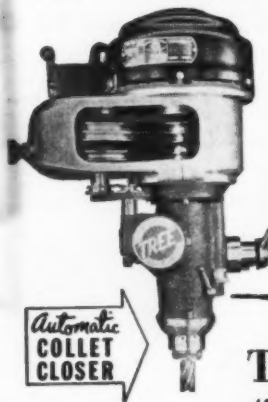
- Facing . . . up to 10" in diameter.



- Outside Turning . . . either straight or tapered up to 8" with extension bar.



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140-3500 RPM or 210-5200 R.P.M. Hardened
& Ground Spindle & Quill. Enclosed
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Wahlstrom Automatic Chucks

"Essential to Operations"

at American Type Founders



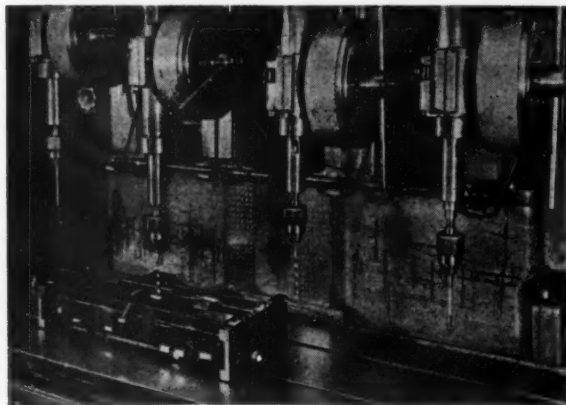
"We have been using AMF Wahlstrom Fully Automatic Chucks for many years. They are essential to our operations," says James F. Stone, Production Manager at American Type Founders. Reason: Drills are changed while spindle is running.

One spindle can do the work of several for you, too, in drill press work... spotting, drilling and reaming in jig

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 **fully automatic**
CHUCKS

NO KEYS, COLLETS OR WRENCHES

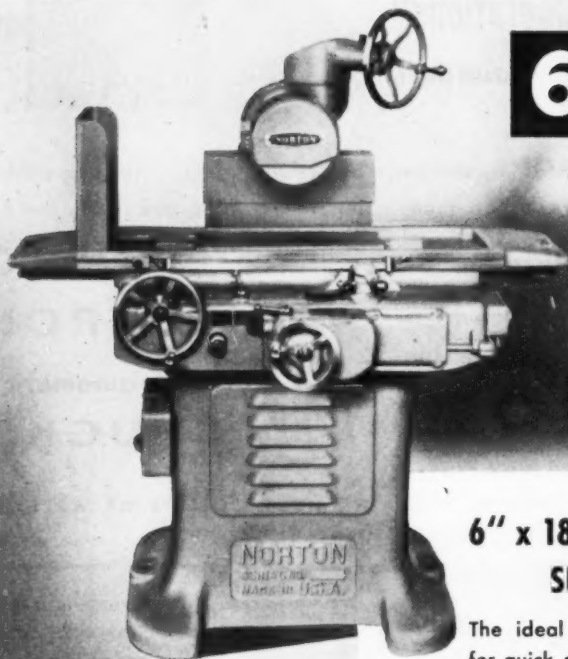


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M-385



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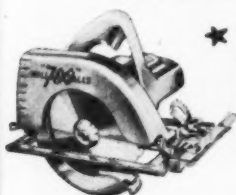
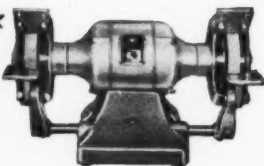


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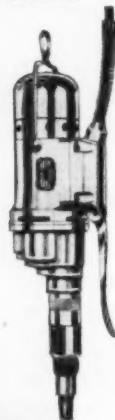
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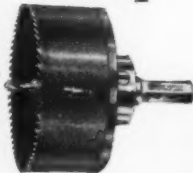
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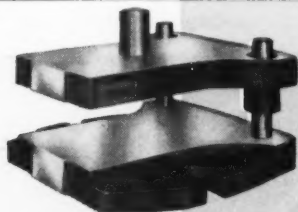
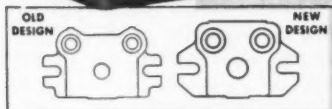
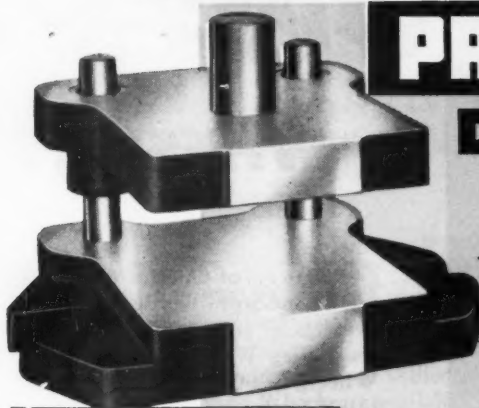
DIE SETS

FOR

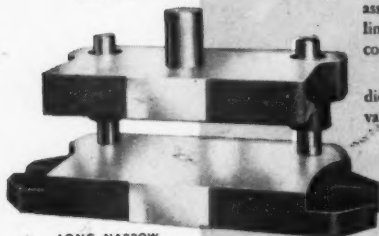
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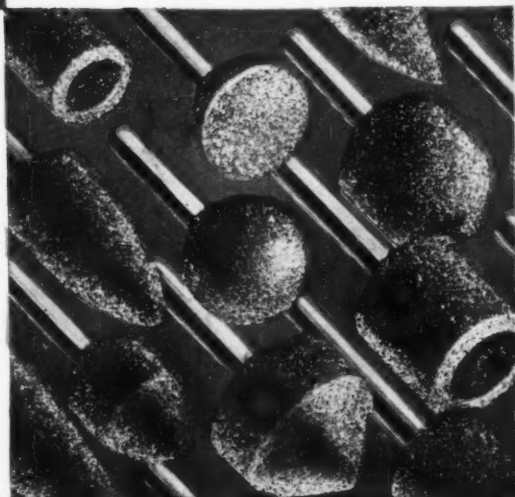


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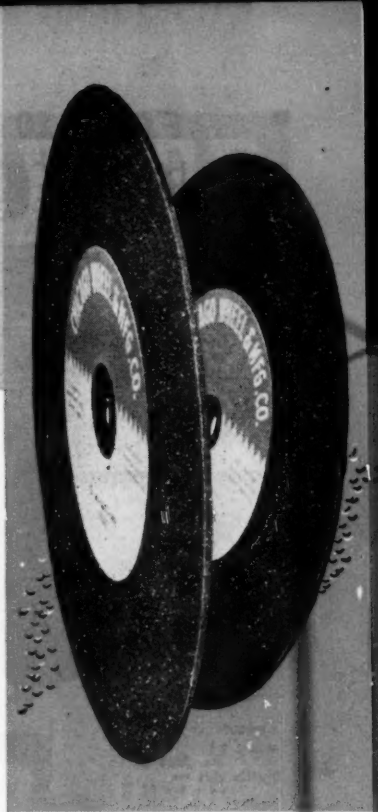
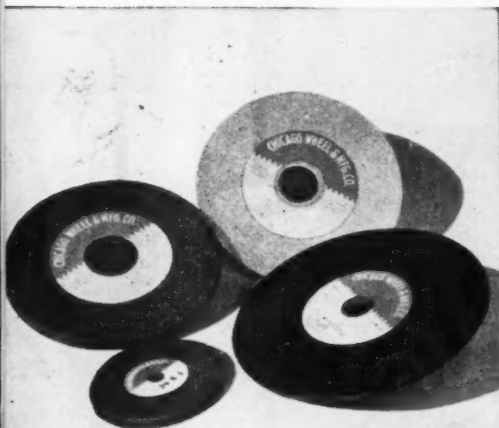
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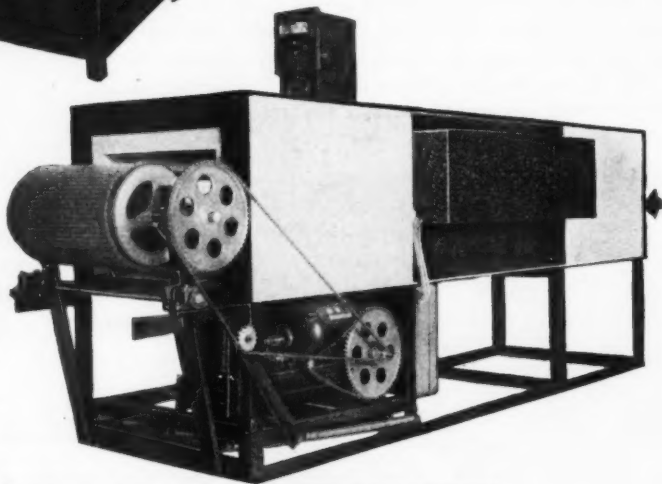


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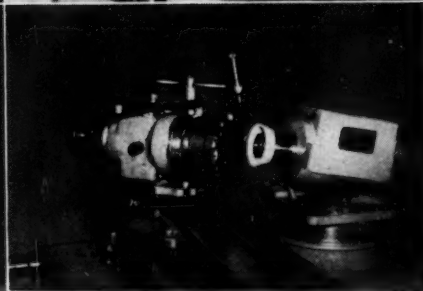
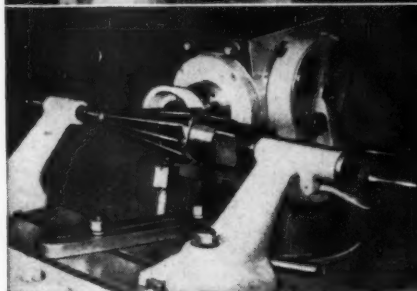
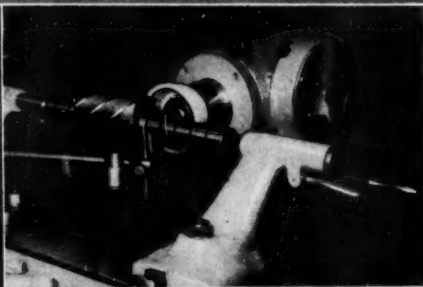
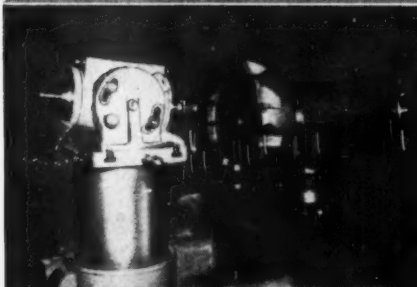


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No. 71

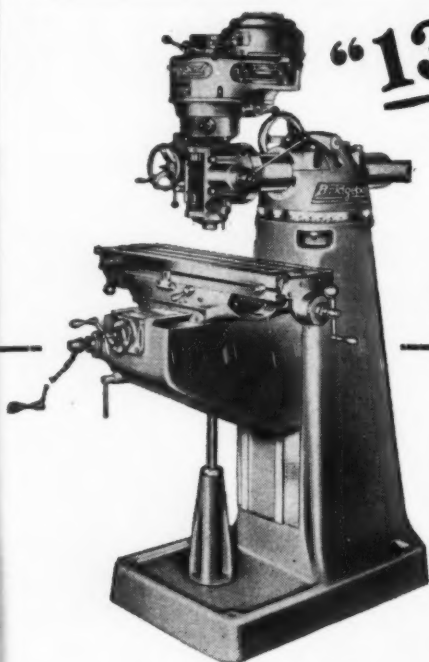
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**... a 12-year record of
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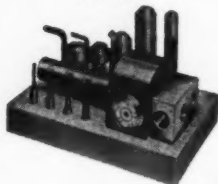
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No. 2 BORING HEAD
This attachment provides the means for boring holes up to 6" diameter. It is applicable to Bridgeport 1 HP Milling, Drilling and Boring Attachments.



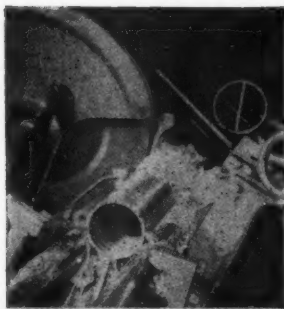
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1/3 THE TIME,
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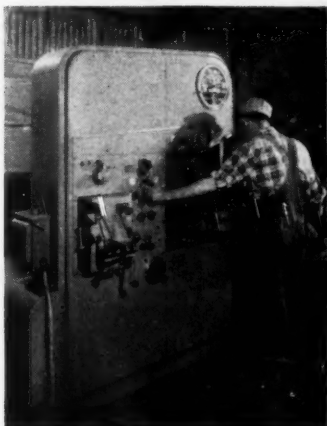
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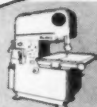
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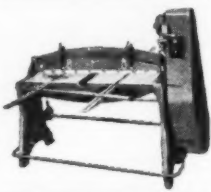
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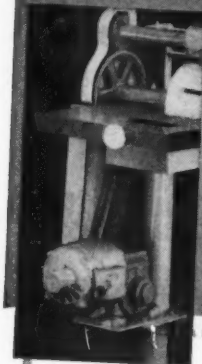


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This compact, efficient, long lived polishing machine drive employs BOSTON RATIONOMOTOR, BOSTON SPROCKETS and CHAIN, BOSTON GEARS.

To save \$12.50 first cost this chain drive on a sheet metal polishing machine was equipped with cheap sprockets. They wore out fast — caused a wobble that hurt machine performance — had to be replaced by BOSTON Sprockets and Chain.

Cost of replacing drive (two men, 4 hrs. @ \$4.25 per hr.) — \$34.00.

Down time loss (profit and overhead) 4 hrs., 30 sheets per hr., \$1.20 per sheet — \$144.00.

$\$144 + 34 - 12.50 = \165.50 net loss.



This textile yarn drawing machine drive employs BOSTON SPROCKETS, BOSTON DOUBLE ROLLER CHAIN, BOSTON GEARS. Oil tight chain case permits oil-bath lubrication. Maximum production, no slippage, no power loss, minimum maintenance are assured by this drive.

To save \$7.40 this textile machine drive was equipped with "bargain counter" sprockets and chain. It wore out and broke down twice, before being replaced by BOSTON Sprockets and Chain.

Cost of replacing drive, two times (two men, 4 hrs. each @ \$3.00 per hr., each time) — \$48.00.

Down time loss (profit and overhead) 80 bobbins, 4 hrs. down, each time, \$1.50 per bobbin — \$120.00 x 2 — \$240.

$\$240 + 48 - 7.40 = \280.60 net loss.

It pays to buy the best — Boston Gear Sprockets. Design them into your equipment. Always specify them for replacements.

BOSTON *gear* stocks are *near*

Stocks at 80 Authorized Boston Gear Distributors—one near you.



Write for Catalog No. 55. It contains a wealth of useful data and selection charts.

BOSTON GEAR WORKS

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Gear Drive



Direct Drive



Motor Drive



Universal Drive



Chain Drive



Roller and Chain



Roller



Roller



Roller



Roller



Roller



Roller



Roller

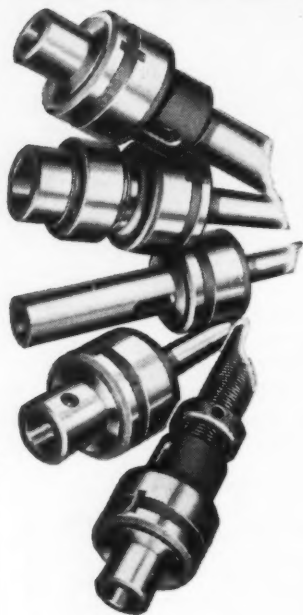


Roller



Roller

Bothered by bell-mouth H_oLES?



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Glenzer **FLOATING TOOLHOLDERS**

They positively correct misalignment—make every hole true-round and accurate. Compensating movements under load correct errors to $\frac{1}{32}$ " radius— $\frac{1}{16}$ " diameter, save valuable set-up time on hand and automatic Screw Machines, Garvin Tapping Machines, Adjustable Multiple Spindles and all types of tapping and drilling machines.

26 STOCK TYPES

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Tools***

Send for Index J Data Sheets

Order any stock size—test on the job 30 days. Return without obligation if you're not delighted with the results.

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THE J. C. GLENZER CO. Inc.

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DoALL Gage Blocks measure in *millionths*. Does every plant need such accuracy?

YES—to control tenths and thousandths. The Tool and Gage Makers Tolerance Chart reveals that to produce a shaft to $1.000 \pm .005''$ tolerance:

1. The *Working Gage* at the machine must be accurate to $\pm .0005''$, ten times that of the part.
2. The *Inspector's Gage* must be accurate to $\pm .00005''$, ten times that of the working gage.
3. The *Master Gage* which checks the inspector's gage must be ten times more accurate or $\pm .000005''$.

There is your requirement for *millionths* accuracy—and with it you'll cut rejects to the vanishing point.

This kind of accuracy is not a luxury. DoALL Gage Blocks are economical, long-lived *working tools* for checking not only other gages but finished parts as well.

For example, with a set of 83 DoALL Gage Blocks and several accessory pieces you can make *120,000 different snap gages for about 1/4 cent each!* And these are gages accurate to millionths, with dimensional stability that keeps them accurate.

Ask to have a DEMONSTRATION of DoALL Gage Blocks in your plant. There are none finer. See for yourself. Call your local DoALL Sales Service Store or write:

THE DoALL COMPANY

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WRITE FOR LITERATURE and ask about DoALL Gage Block CALIBRATION SERVICE that assures you of faithful accuracy.



GS-1

INDUSTRY'S
NEW
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DoALL

27
SALES-SERVICE
STORES



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies



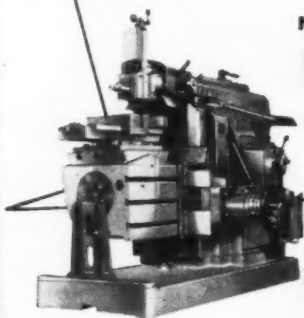
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COSTLY OBSOLESCENCE..."

INCREASE PRODUCTION
WITH MODERN **GEMCO**

MATCHED-FOR-THE-JOB

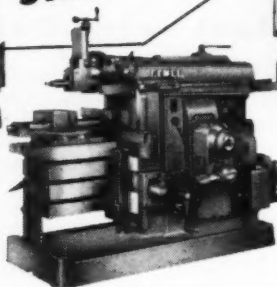
**PRECISION
SHAPERS**

3
MODELS



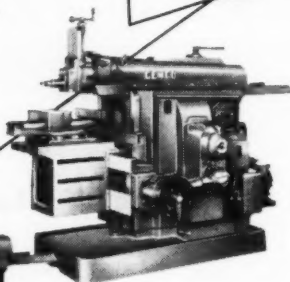
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For tool and die work and general machine shop work requiring frequent changes and angular settings. In sizes from 16-in. heavy duty to 36-in. standard duty, with Front Table support. LUBRIGARD protected.



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For general machine shop use and heavy production work. In sizes from 16-in. heavy duty to 36-in. standard duty and with separate Table and Apron and with Front Table support. LUBRIGARD protected.



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For average machine shop use and light production work. Available in sizes from 16-in. heavy through 20-in. heavy duty. Equipped with plain table and with or without Front Table support. LUBRIGARD protected.

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GC 13M



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GENERAL ENGINEERING & MFG. CO.

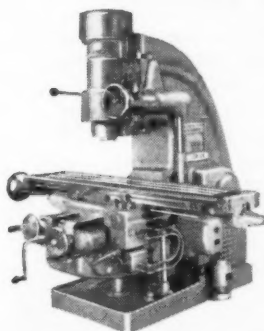
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MILWAUKEE

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Kearney & Trecker's new CK line of Knee-Type Milling Machines is complete with Plain, Universal and now — Vertical styles. These new Vertical CK's have every feature of the CK line. Features that are job and test-proven — designed to fill today's immediate needs — and to meet your tomorrow's milling requirements. You'll find they have all the new CK cost-cutting advantages — Greater Rigidity, Greater Horsepower, Greater Cutting Efficiency, Greater Productivity, Greater Versatility, Smoother

Feed Performance and Greater Machine Life. If you need a new vertical style knee-type mill—don't fail to investigate these new CK's. For without reservation, the new CK line of knee-type milling machines — Plain, Universal and Vertical — are the finest Kearney & Trecker has ever offered to the metalworking industry. Your choice of five sizes — 10 hp No. 2, 15 hp No. 3, and 25 hp Nos. 4, 5 and 6. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

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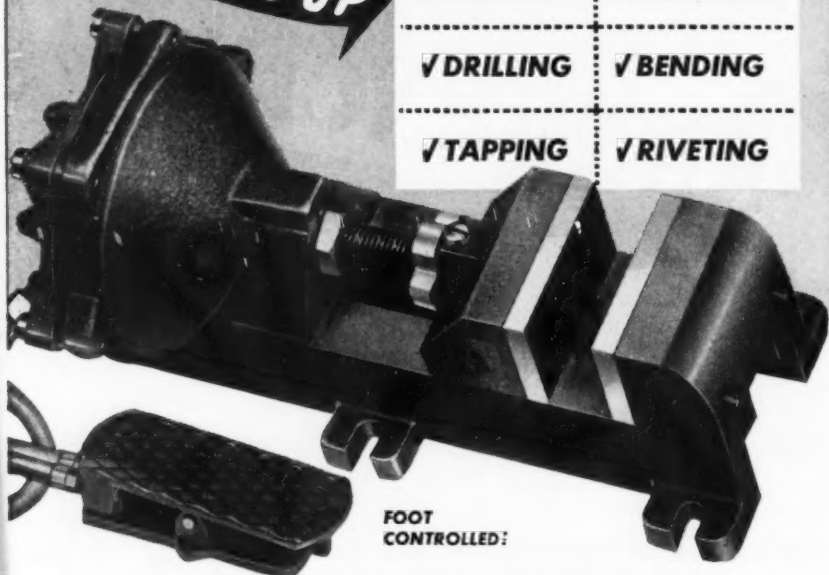
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Precision - built.
Delivers pressures
up to 140 lbs. With
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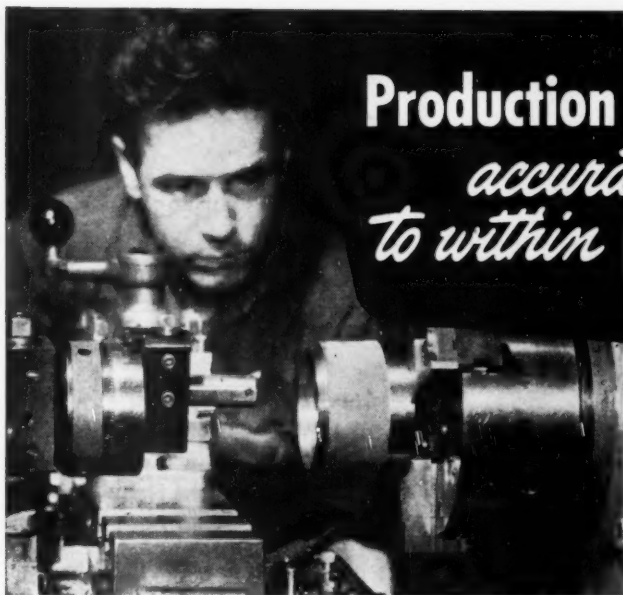
Keeps water
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Looks and
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like a gun. Ideal for
cleaning and blowing
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scraps, etc. . . \$3.00



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With New Improved E-Z Set Boring Tools!

Here is a tool to end your precision boring problems. E-Z Set boring tools are accurate to within 0.0001" . . . employ micrometer-type adjustment . . . facilitate rapid and accurate set-up . . . utilize interchangeable shanks for application with any machine tool . . . and have a wide range of adjustability to meet specific requirements for any precision boring job.

MAXWELL E-Z Set boring tools feature increased tool rigidity through utilization of larger dove-tail areas and ground-fit male and female dove-tail sections.

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- ✓ Boring range to 20"
- ✓ Interchangeable shanks
- ✓ Universally adaptable



216-MC

THE MAXWELL COMPANY

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August, 1951

67



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Established in 1900

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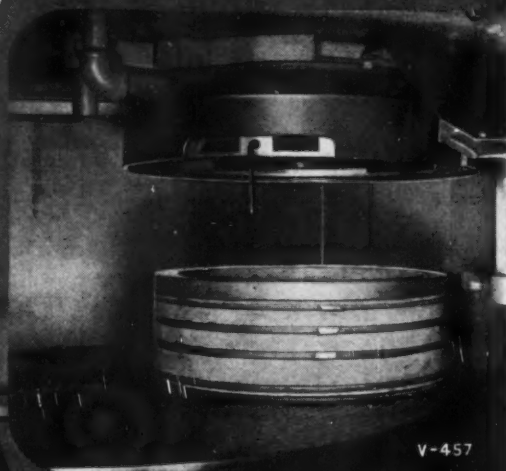
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R AND L Tools

GET EXTRA PRODUCTION CAPACITY QUICKLY!

Do you know that the R and L Turning Tool can be adjusted to do three separate operations at one station on your screw machine—for example—turn two diameters and drill or ream at the same time?

Because of its original design it can also be used as a single point turning tool, pointing tool, centering and facing tool, back-rest, floating holder and knee tool.

These features and its quick changeover from right to left hand turning, enable the user to increase production and at the same time lower tooling costs.

If you are looking for a sure way to increase production capacity, the R and L Turning Tool offers an economical solution.

Write for the new 28 page R and L booklet showing examples of the many time saving, tool saving, money saving operations possible with this single, useful tool. Built in five sizes, it does a wide range of operations on most turret lathes and screw machines.



R AND L TOOLS

1825 BRISTOL ST., PHILA., PA.

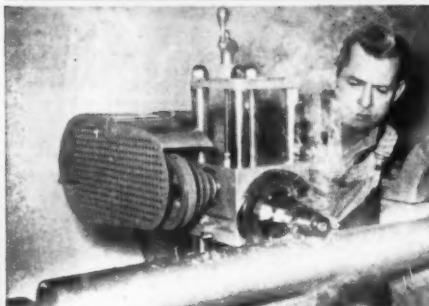
TURNING TOOL—UNIVERSAL TOOL POST—FLOATING DRILL HOLDER—CARBIDE AND
ROLLER BACKRESTS—REVOLVING STOCK STOP—TAP AND DIE HOLDER—CUT-OFF BLADE
HOLDER—TURRET BACKREST HOLDER—RELEASING ACORN DIE HOLDER—KNURLING
TOOL—RECESSING TOOL

NEW

MODEL'S—FEATURES

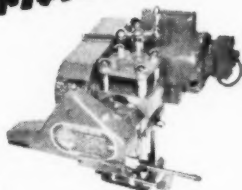
MASTER MILLING ATTACHMENTS

FOR PRODUCTION—TOOL ROOM—EXPERIMENTAL AND MAINTENANCE SHOPS

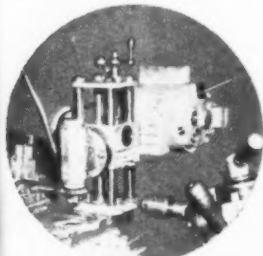


MILLING ON LATHE—Model "M" 1½ h. p. milling ½" keyway one foot per minute.

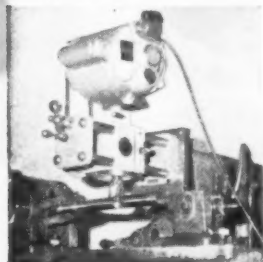
**LATHES
TURRETS
AND
MILLING
MACHINES**



*Master Universal
Slotting and Keyseating Head*



MILLING ON TURRET—Model "B" with 90° milling head mounted on rear cross-slide for keyways, slots, cross milling—completing part in turret.



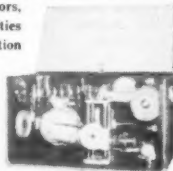
ON MILL—One or two milling heads can be used on post assembly for single or multiple milling cuts. Mounts on overarm for vertical milling or cross-ways for opposed milling head.

3 SIZES • CAPACITIES

- Model "C"—½ h. p. motor—9" to 13" swing lathes
- Model "B"—½ or ¾ h. p. motor—14" to 18" swing lathes
- Model "M"—1 or 1½ h. p. motor—18" to 72" swing lathes

The Master Lathe Converter is a precision multi-purpose machine tool attachment adaptable on most all basic shop machines. The basic unit does milling, drilling, boring, and has eight interchangeable heads for milling, drilling, grinding, slotting, keyseating, and indexing. Spindle speeds, 50 to 15,000 rpm. It provides complete machining facilities with minimum equipment investment, produces more operations per set-up thus increasing production of your present equipment, saves work transfer, assures accuracy, is simple and fast to set up. Prime and subcontractors are converting their present equipment for special applications and production with the multi-purpose Master Lathe Converter.

COMPLETE SHOP KIT—This group of equipment includes basic milling unit, external and internal grinding heads, 90° universal and hi-speed milling heads, slotting or internal keyseating head, 40 to 1 geared dividing head, seven arbors, in a heavy plywood shop cabinet. This kit provides facilities for most all machine shop operations on a lathe at a fraction of the investment required for individual machines, plus wide use on other basic shop machines. Ideal for maintenance and repair, tool room, experimental, mobile units, aboard ships, and production shops.



- ★ MILLING ★ DRILLING ★ BORING
- ★ THREAD MILLING ★ GRINDING
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- ★ INTERNAL KEYSEATING

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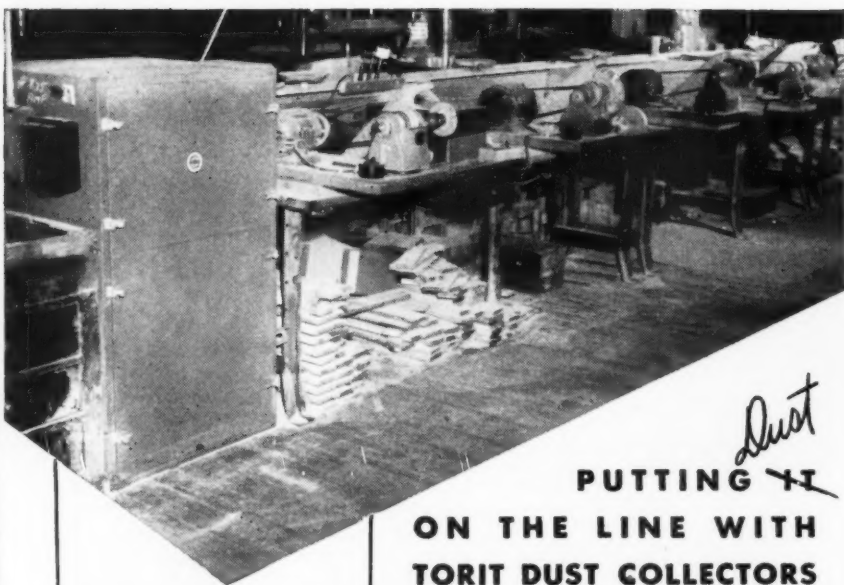
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Assures greater accuracy and speeds up work. You will save time and money on all layout jobs.

A sample is waiting for you. Send for it today.



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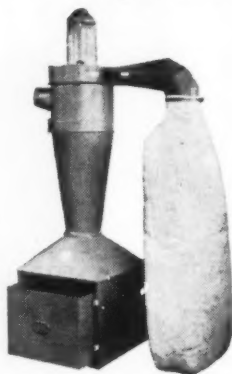


Dust

PUTTING IT

ON THE LINE WITH TORIT DUST COLLECTORS

TORIT FB Type Dust Separator



Torit also manufactures a line of cyclone type dust separators. These can be ordered with an after-filter, as shown above, which permits recirculating the cleaned air within the plant.

In this line up there are six small wheels and disks, all connected to one Model 84 Torit Dust Collector. These are being used to finish small wooden parts, but the set up is equally applicable to metal, plastics, or other materials.

This installation well illustrates the adaptability of Torit Dust Collectors to production line operations. Pipes, collecting hoods, and even the dust collector are located so they do not cut off light or interfere with the work. Efficiency, too, is high.

There is a Torit Dust Collector for your dust collecting job. You'll find it economical to install and exceptionally low in operating and maintenance costs. For details, and latest Torit catalog, write:

TORIT

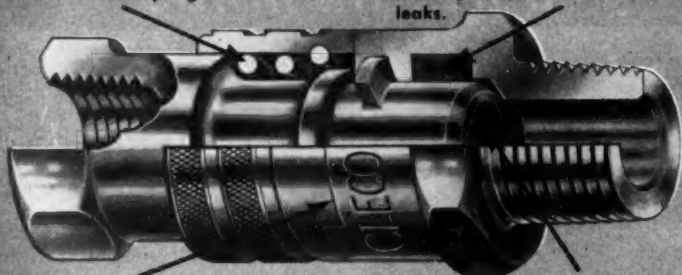
Manufacturing Co.

303 Walnut Street

St. Paul 2, Minn.

1. **POSITIVE LOCKING.** Spring loaded locking ring prevents accidental uncoupling of hose.

2. **PRESSURE-SEAL PACKING.** Line pressure expands lip-type packing to prevent costly air leaks.



3. **QUARTER-TURN OPERATION** Instant coupling and uncoupling saves operator's time and management's money.

4. **FULL-OPENING.** Cleco Couplings pass full line pressure to the tools, assuring fast, efficient operation and lowest production costs.

four reasons why your air lines should have **CLECO COUPLINGS**

**CLECO MAKES A
COMPLETE LINE OF
AIR LINE FITTINGS**

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**WRITE FOR BULLETIN
No. HF-747**

Cleco Couplings make air tools more profitable. They prevent leaks and deliver full air pressure to the tools. They have a long useful life and they are not easily damaged by ordinary handling.

Made in either brass or steel. The steel couplings are cadmium plated to prevent rust.

Cleco Couplings are made in a complete range of sizes from $\frac{1}{4}$ " to $1\frac{1}{4}$ ". Write for full information.



CLECO DIVISION

of the REED ROLLER BIT COMPANY

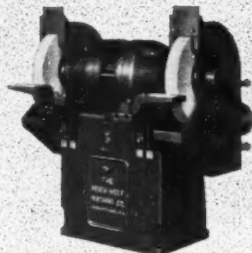
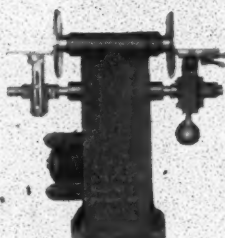
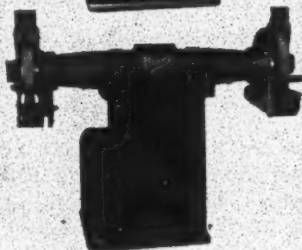
5125 CLINTON DRIVE

HOUSTON 20, TEXAS



GRINDERS?

Sure! All Kinds



Wet Grinders and Dry Grinders
 Drill Grinders and Disc Grinders
 Grinders with extra wide
 wheel spacing
 Bench Grinders and Pedestal Grinders
 Lathe Grinders and Center Grinders
 Grinders for snagging or tools
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HISEY Catalog No. 71-BJ lists more
 than 200 different types and sizes of
 Grinders from $\frac{1}{4}$ to 25 H.P. capacity.

Write for it now.

Also a complete line of Buffing and
 Polishing Machines in direct drive
 and V-Belt drive models.

Hisey THE HISEY-WOLF MACHINE CO.
 CINCINNATI 8, OHIO
 Division of The Cincinnati Electrical Tool Co.



Arrows point to NOPAK Model "D" Air Cylinder which locates workpiece for clamping. NOPAK 4-Way Valve is shown in circle.

NOPAK 4-WAY VALVE Controls Model "D" Cylinder and Air Chuck on Sundstrand Lathe



NOPAK $\frac{1}{4}$ " 4-Way Hand Valve controls both air chuck and NOPAK Model "D" Air Cylinder.

In this lathe application, a $\frac{1}{2}$ " NOPAK 4-Way Valve performs two vital functions. (1) It controls the NOPAK Model "D" Cylinder which locates the workpiece before clamping, and (2) it operates the air chuck. When the valve is open, the chuck is unclamped and the "locator" is down; when the valve is closed, the chuck is clamped and the "locator" is up.

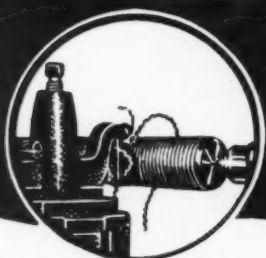
This application of a NOPAK Valve and Cylinder is typical of many in the machine-tool field. It may suggest how you can use NOPAK products to improve the performance of machines or equipment which you use in your plant, or build for others.

GALLAND-HENNING MFG. CO.
2754 S. 31st Street, Milwaukee 46, Wis.

Write for Bulletin SW-1 or refer to Sweet's File for Product Designers.

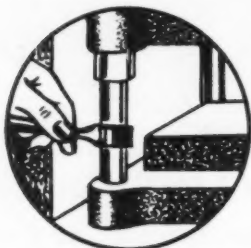
Representatives in Principal Cities

NOPAK
VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE



Increase YOUR HOURLY OUTPUT!

On **Lathes** and other machines using centers, CMD LUBRICANTS prevent dangerous seizure, waste and costly delays.



On **Die Set Pins and Bushings** CMD LUBRICANTS minimize wear and time-out to re-lubricate.



On **Steady-Rests** CMD LUBRICANTS assure smooth, true turning of work and complete freedom from scoring and seizure.

*Lubricate Machines
with Longer-Lasting*



Anti-Scoring
LUBRICANTS

For smooth performance and greater man-hour production, protect your machines with CMD Anti-Scoring Lubricants. Because they withstand pressures greater than 50,000 pounds per square inch and will not mulsify with liquid coolants, they protect bearing surfaces better and longer. Illustrated here are just a few of the many applications where CMD Lubricants are cutting costs. But see for yourself. Test CMD Lubricants on your toughest operations.

Write for FREE Samples!
Address Dept. 8-BB



**CHICAGO MANUFACTURING
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...for the finest tools and dies!

For the precise hardening and tempering of expensive tools and dies—specify Lindberg Hardening and Tempering Furnaces.

FOR HARDENING—eliminate finishing due to scale and decarb with simple accurate atmosphere control.

FOR TEMPERING—obtain the exact “Rockwell Hardness” needed for the ultimate performance from your tools and dies.

LINDBERG ENGINEERING COMPANY

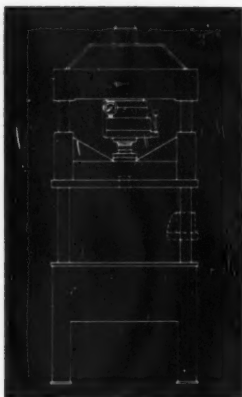
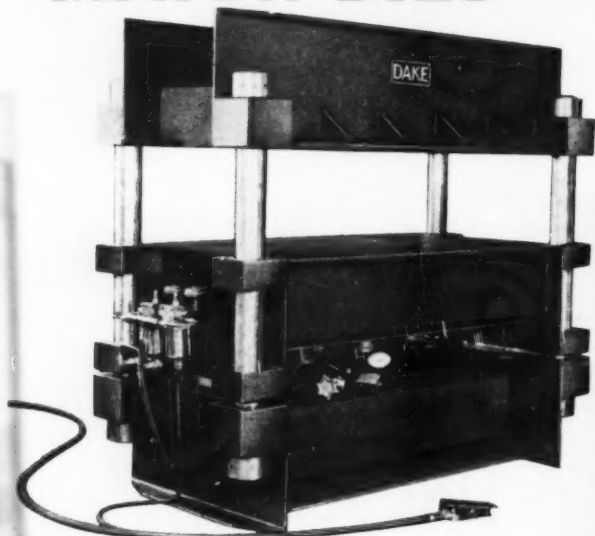
2442 W. Hubbard Street, Chicago 12, Illinois.

LINDBERG



FURNACES

MATCH DIES *in the toolroom*



DAKE Die Try-Out Press saves tying up production equipment

The photograph above shows a specially engineered, custom-built DAKE Die Try-Out Press of 125-ton capacity. Its guided platens assure uniform alignment in testing, enabling die-makers to match dies perfectly before they leave the toolroom.

This press was designed with an air-operated hydraulic cylinder and single-acting piston in the base. At the end of the upward stroke the release valve is opened, permitting the platen to

descend by gravity.

The drawing illustrates another DAKE Die Try-Out Press—a 50-ton model with hydraulic workhead above the upper platen. The ram is powered on both up and down strokes.

Either of these presses may also be used for sample or short-run production. If you have a problem which requires development of a special press, it will pay you to communicate with DAKE.

Daik Engine Company, 608 Seventh St., Grand Haven, Mich.



**Here's
GOOD NEWS**
for every
METALWORKING PLANT

EXTRA SPECIAL

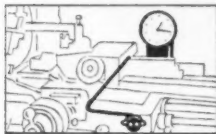
Scott New

**DISTOMETER MEASURES
DEPTH OF CUTS WHILE
MACHINE IS IN MOTION**

**SAVES
DOWN TIME ON
LATHES, MILLERS
GRINDERS ...**

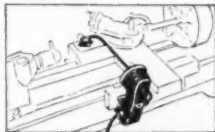
**PRODUCTION
SPEEDED AS
GUESSWORK
IS ELIMINATED**

**Accuracy
Assured as
Costs Drop**



Front view showing Distometer with electrical switch placed near the operating levers of the lathe.

Rear view showing how easily the Distometer can be installed on machines.



This device specifically calibrates or indicates advancement of any cutting tool in such machines as lathes, grinders, boring machines, etc. The primary object of the DISTOMETER is to make possible a rapid and visual calibration of longitudinal travel. Another purpose is to provide a means whereby fluctuations in gearing or connections affecting the reading of indicator are compensated for by means of a constant counteracting torque electrically applied to the indicator shaft. Lathes of any bed length can use the Distometer! Improve and maintain a higher degree of accuracy on any age machine tool!

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DETROIT 24, MICHIGAN

August, 1951

83

THE **MAC** REVOLVING CENTER

*The Precision Center for Precision Work.
For all types of lathes and external grinding.*



CHECK THE THREE POINT SWIRLING BEARING ACTION

- ✓ 1. A bearing designed exclusively for revolving center to absolutely maintain true alignment.
- ✓ 2. The only adjustable Ball Bearing Center.
- ✓ 3. The entire MAC REVOLVING CENTER is made from bearing steel and heat treated to Rockwell C-62 minimum.
- ✓ 4. Bearing design reduces friction to an absolute minimum. No over heating at high speed.
- ✓ 5. MAC'S styling and design so greatly reduce the cost of revolving centers it is no longer profitable to tolerate stationary center upkeep.
- ✓ 6. MAC points the way to cutting costs by Durability, Accuracy, Speed through design.

Try a MAC. IT IS GOOD. LITERATURE ON REQUEST.

THE WHITFIELD MFG. CO.
Washington Court House, Ohio

**Production
increased
and
costs cut
by
BROACH
REDESIGN**

The job in question is broaching the surface and edges of automotive main bearing cap castings. The surface skin is very hard and highly abrasive—so much so that the conventional slab broach requires sharpening very frequently.

To get more production and reduce the down-time for regrounding broaches, the broaches themselves were redesigned by Red Ring engineers with the forward teeth V-shaped to notch the hard casting surface down to readily machineable metal. Successive teeth extend the notch outward on both sides while the final finishing teeth function just as those of a conventional slab broach. In this way, broach teeth are exposed to a minimum contact with the abrasive casting skin and, consequently, hold their cutting edges much longer.

These new broaches have materially increased the parts per grind and the down-time for resharpening has been reduced 70 per cent.

This is one of the many problems Red Ring engineers have solved for broach users. Yours could be the next. If you haven't a copy, write for Bulletin 49-11 on broaching.

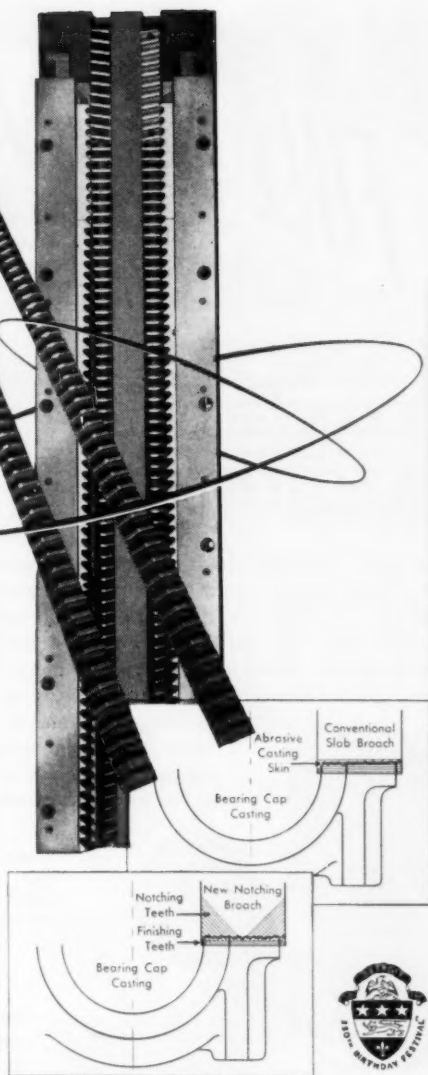
SPIN AND HEURAL
GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING
AND ELLIPTICAL TOOTH FORM



NATIONAL BROACH AND MACHINE CO.

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WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT



FULL SPEED AHEAD

**IS THE
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**and You Can
Command It With
D.P.S. MOTORIZED
Selective Feeding
HOPPER UNITS**

Hopper feeding 30 caliber shell discs, concave side up, to press for drawing operations.



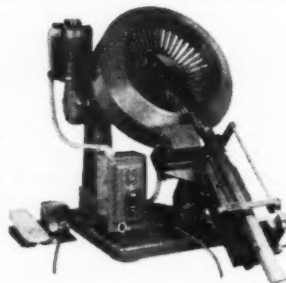
Modern production methods demand more speed and accuracy in the selection and feeding of parts than can be accomplished by hand . . . Our 25 years experience as pioneers in the assembly field enables us to ably meet this demand with the D.P.S. Motorized Hopper Units, the outstanding

selective feeding devices with which production parts of a wide variety are selected, oriented and fed in a given position for primary and secondary operations . . . They are a completely self-contained unit, including drive and feed track. They are easily adaptable to presses, centerless grinders, thread rolling and slotting machines, also special machines . . . Six sizes, 8", 10", 12", 16", 24" and 30" diameters for handling various sizes of parts. No matter what your feeding problem is, we can meet your requirements. Designers of special equipment will also be interested.



Sixteen-inch hopper mounted on tapping machine equipped with air-operated dial—completely automatic operation.

Counting and feeding hopper with adjustable escapement to accommodate varying quantities.



Send for further details, also information about D.P.S. Power Screwdrivers, Nut Drivers and Special Assembling Machines.

DETROIT POWER SCREWDRIVER CO.

2809 W. FORT ST.

DETROIT 16, MICHIGAN

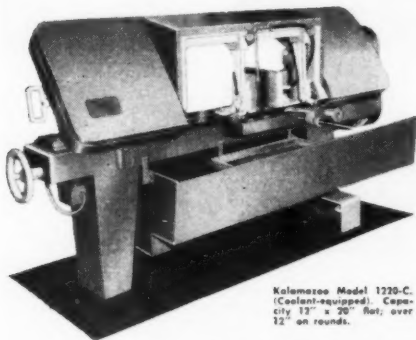
"1220"

**THE
NEW**

Kalamazoo

METAL CUTTING BAND SAW

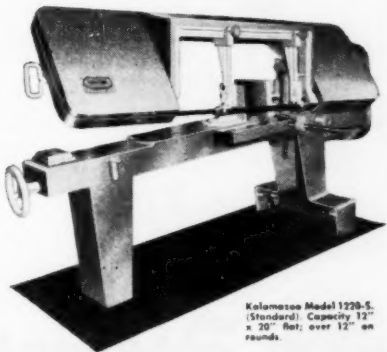
- ▶ Big, Rugged Capacity At Much Lower Price!
- ▶ 4 Cutting Speeds!
- ▶ 45° Swivel Leaf-Type Vise!
- ▶ Quick, Easy, Half-Minute Blade Changes!
- ▶ Full 1 HP Motor!
- ▶ Unique Dash-Pot Mechanism For Controlled, Constant Pressure On Cuts!
- ▶ Unobstructed View of Cutting Operation!
- ▶ 1" Blade For More Speed and Precision on Cuts!



Kalamazoo Model 1220-C.
(Coolant-equipped). Capacity 12" x 20" flat; over 12" on rounds.

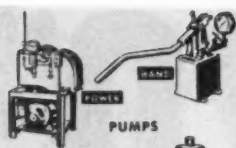
For continuous high-speed heavy-duty cutting, the 1220 coolant model, above, fills the bill. It handles prolonged production runs with ease—cuts to an accuracy of a few thousandths with no burr, minimum kerf. It is exceptionally rugged and rock solid—maintains precision from start to finish on every job, every cut. For heavy-duty cutting where operation is not continuous, or where non-ferrous metals are cut, the 1220 standard model, at right, is ideal. Identical with the coolant model except for the coolant system. Has the same speed, precision, and power for outstanding heavy-duty performance. Send for complete descriptive literature today.

A big saw—a rugged saw—a saw especially designed for fast, efficient, precision cutting of oversize bars, rounds, tubes, pipe, angles, and odd production shapes! . . . priced way below all other saws of near-equivalent capacity . . . that's the new Kalamazoo 1220! It's ready to go to work for you on heavy-duty production cutting of metals hour after hour, job after job—month in and month out. The 1220 in your plant will speed production and slash unit cutting costs on intermittent or continuous cutting. It has every feature—many of them exclusive—to do a better cutting job for you at new low cost.



Kalamazoo Model 1220-S.
(Standard). Capacity 12" x 20" flat; over 12" on rounds.

MACHINE TOOL DIV. *Kalamazoo* TANK and SILO CO.
821 HARRISON STREET • KALAMAZOO, MICHIGAN



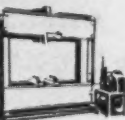
PUMPS



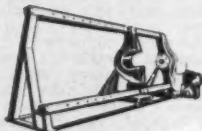
CYLINDERS



UNIVERSAL PRESS



SHOP PRESS



FORCING PRESS



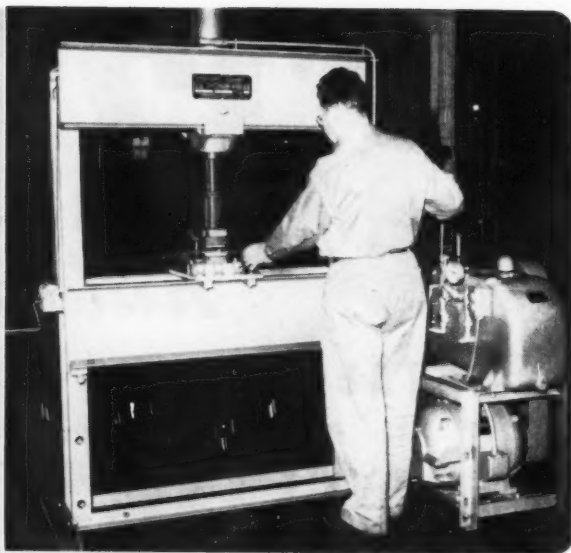
TRACK PRESS



PINION PULLER



JACKING UNIT



Above is a standard Rodgers 60 ton Shop Press with a Rodgers Power Pump. Other models have capacities of 80, 100, 150, 200, 300 and 400 tons.

HERE'S

***Rodgers Hydraulic* POWER**

**...to do 101 jobs
faster, better, easier**

You'll find a Rodgers Shop Press is the finest all-around time-and-labor-saving equipment you can have in your plant... for a multitude of pressing, forming, bending, straightening jobs... for die tryout... and even short production runs.

Their many exclusive features make Rodgers Shop Presses unusually versatile in performance... and there are several standard models and capacities to suit most every shop or plant requirement.

Other Rodgers Hydraulic Equipment is available too, for your special jobs.

SEND FOR CATALOGS

Complete details of Rodgers Equipment are covered in available catalogs. Write for them.



Rodgers Hydraulic, Inc.

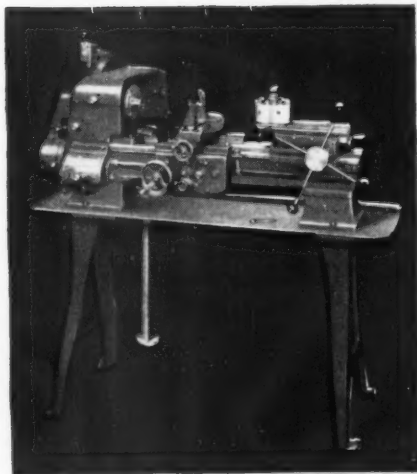
7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

USE **LOGAN** **LATHES**

FOR PROVED PRODUCTION PERFORMANCE

Production results over the years have demonstrated the efficiency, durability and economy of Logan Lathes. These results are the reasons why industry is using more Logan Lathes today than ever before.



Logan No. 940-2—11" Quick Change Gear Turret Lathe with 1" Collet Capacity, and 1 3/4" Spindle Hole. One of 37 Models of Logan 10" and 11" Swing Lathes



LOOK TO

FOR BETTER LATHES AND SHAPERS

FOR FULL INFORMATION, VISIT YOUR LOGAN DEALER, OR WRITE

LOGAN ENGINEERING CO.

4901 WEST LAWRENCE AVENUE • CHICAGO 30, ILLINOIS

THESE LOGAN CHARACTERISTICS WILL HELP YOUR PRODUCTION

CAPACITY . . .

With 1" collet capacity, 11" swing, 1 3/4" spindle hole and center distances of 24" and 36", Logan Lathes have the size to handle substantial work.

ACCURACY . . .

Less than .0005" spindle runout 12" from the bearing . . . two V-ways and two flat ways precision ground to within .0005" variation . . . these are typical Logan Lathe construction tolerances.

VERSATILITY . . .

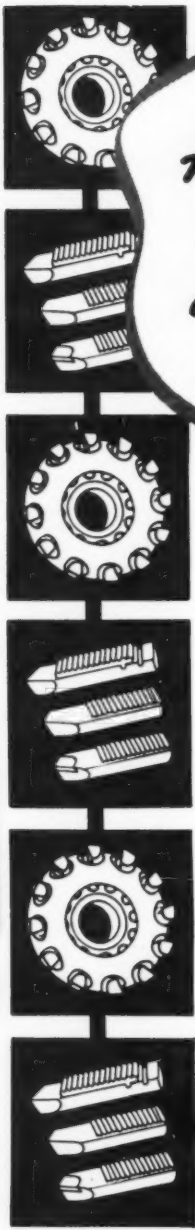
The Logan Lathe gives you spindle speeds of 45 to 1500 rpm with no bearing adjustment. A complete line of accessories further equips these versatile tools for every type of lathe operation.

RUGGEDNESS . . .

With its ball bearing mounted spindle, its self-lubricating bronze bearings at vital wear points, and its rugged overall construction, the Logan Lathe retains its accuracy and dependability under constant use.

ECONOMY . . .

By reducing power costs; by saving vital floor space; by quick, easy set-ups; by lasting accuracy and low maintenance; Logan Lathes put many metal turning operations on an economical and profitable basis. The saving to be realized on your original investment in Logan Lathes is a further economy well worth considering.



*All Lovejoy Blades for
Type "A" Milling Cutters
are interchangeable from
4½" to 24" in diameter*

... and this applies to
every "A" cutter ever made!

Lovejoy Type "A" face milling cutter blades offer unsurpassed economy — 1) they are interchangeable throughout the complete range of housing sizes, 2) H.S.S., carbide and cast alloy blades are interchangeable in every housing, 3) every blade will fit every Type "A", even if you have housings 30 years old, 4) only a minimum of stock must be removed when sharpening, 5) a large percentage of every blade is usable; 6) there is no need to carry a large inventory, as Lovejoy can supply blades promptly from stock. For superior performance, plus maximum economy, use Lovejoy Type "A" for every face milling job.

Write for free catalog!



136 MAIN ST., SPRINGFIELD, VERMONT

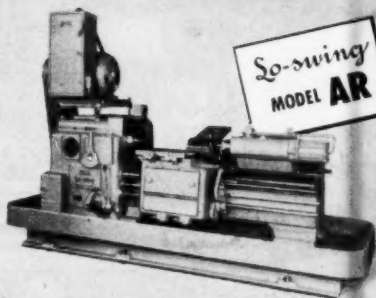
LOVEJOY
TOOL COMPANY, INC.

PRODUCTION COSTS ARE LOWER WITH *Lo-swing*

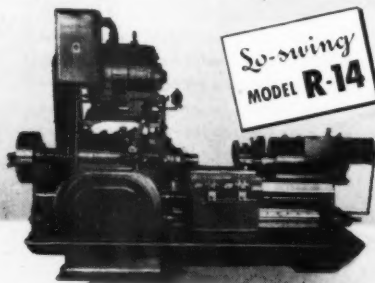
● There is a Lo-swing full or semi-Automatic Lathe for practically *any* production turning job . . . automotive, industrial or ordnance. Write for Catalog No. 50 describing these, and other, cost-cutting Seneca Falls machines.



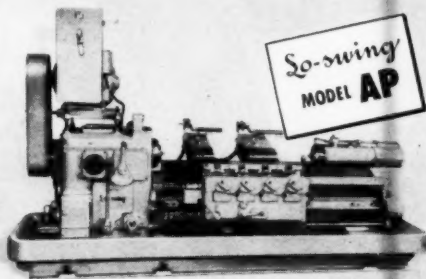
Lo-swing
IMP



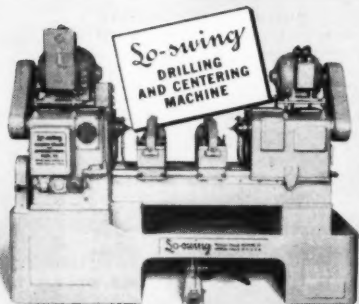
Lo-swing
MODEL AR



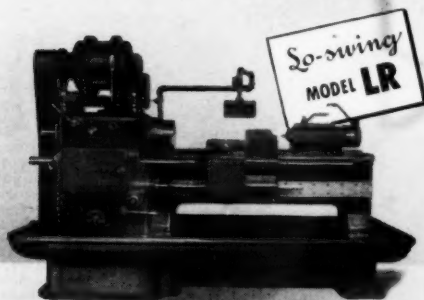
Lo-swing
MODEL R-14



Lo-swing
MODEL AP

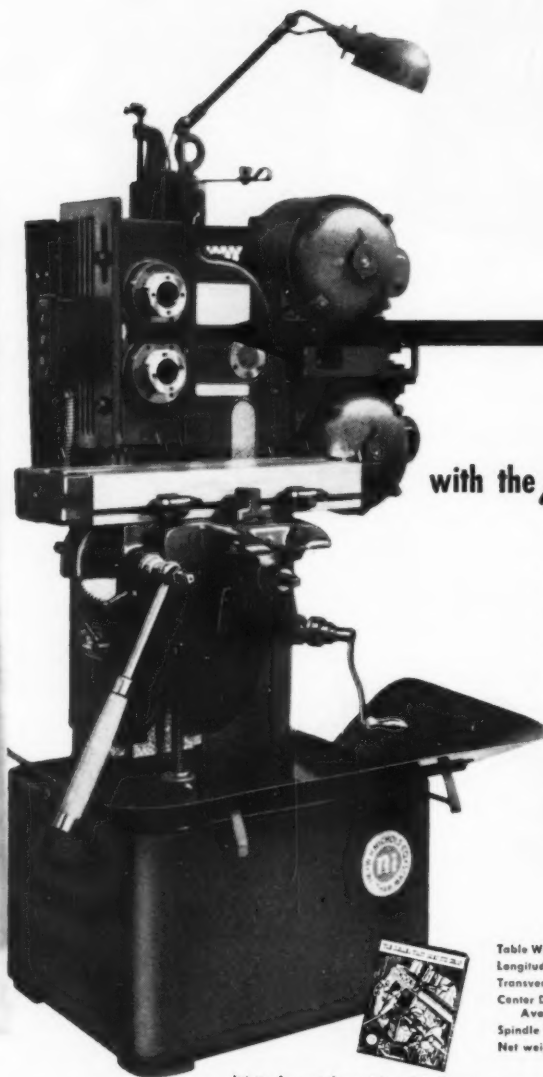


Lo-swing
**DRILLING
AND CENTERING
MACHINE**



Lo-swing
MODEL LR

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.



TWO FOR ONE

with the *Nichols* Double-Decker!

The Nichols "Double-Decker" Two-spindle Miller actually gives you two milling operations in one pass! It is equally adaptable to small or large lot production of small parts where parallel flats or grooves, or opposed faces cannot be straddle milled, or otherwise must be indexed for two operations with a single cutter. Its time-saving features are readily apparent. Spindles may be separated from $\frac{3}{8}$ " to 7" (or more) to accommodate various sizes of cutters and work. Table can be arranged for hand operation or with automatic work cycle, and with high or low spindle speeds.

CONDENSED SPECIFICATIONS

Table Working Surface	6 $\frac{3}{4}$ " x 21"
Longitudinal Travel	10"
Transverse Travel	7"
Center Distance of Spindles Available Between	3 $\frac{1}{8}$ " and 14 $\frac{1}{2}$ "
Spindle Speeds Available	up to 5000 R.P.M.
Net weight approx.	1250 lbs.

Write for catalog giving details on lever, screw and air-feed models, plus three types of double spindle Nichols Millers.

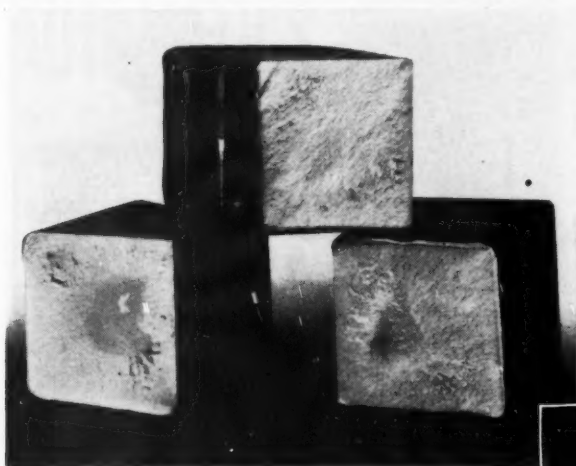
Inquiries must be submitted in detail, as specifications and capacities are governed by user's needs.

MANUFACTURED BY W. H. NICHOLS COMPANY WALTHAM, MASSACHUSETTS

NATIONAL DISTRIBUTORS **NICHOLS-MORRIS CORPORATION**

50-G CHURCH ST.
NEW YORK 7, N. Y.

DO YOU KNOW THE ADVANTAGES OF **SHEARING** BILLETS OVER NICKING AND BREAKING?



Above are sections of 4½-inch alloy steel billet cut by a "Buffalo" Billet Shear, showing the clean, square cuts produced. There is no "smearing" of the metal, or "notches" on one edge, as in nicking and breaking. "Pipes" in the billet could be easily detected. Sheared pieces are kept to uniform weight, and there is no expense for gas and burner. Best of all, these pieces are cut at the rate of **10 per minute!** "Buffalo" Billet Shears are built in sizes to handle up to 10-inch rounds and 9-inch squares. HUNDREDS are in use! WRITE FOR BULLETIN 3295-A, for facts on lower cost shearing of billets.

- HIGH CUTTING
- CLEAN, SQUARE CUTS
- UNIFORM, SHEAR PIECES



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161 Mortimer Street

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING



At CIRCLE 
*Quality
 Makes Progress*

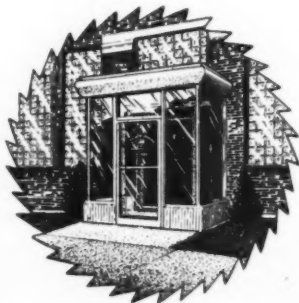
Over the years Circle® Metal Cutting Tools have established a quality reputation unexcelled anywhere! Circle® is expanding its plant for the sole purpose of

ensuring the maintenance of these high quality standards . . . a decision which will give you still higher quality and the most efficient and economical circular cutting tools available.

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Potter & Johnston AUTOMATICS

ARE RECOGNIZED THE
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**RIGHT TOOLS
FOR THE JOB**

— for high speed, fully automatic, precision machining of forgings, castings and cut-off bar stock . . . anything from a few ounces to several hundred pounds.

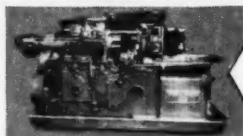
— for combining cuts to avoid secondary operations . . . and to eliminate all unnecessary work handling.

With the right P&J Tooling for the job . . . on the right P&J Automatic Turret Lathe . . . you will produce better work . . . and more of it . . . with fewer rejects.

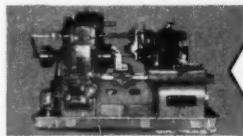
We invite you to investigate. Write us, or our representatives for additional information.



3U SPEED-FLEX AUTOMATIC
Takes work up to approx. 6 inches diameter. Spindle speeds up to 1445 r.p.m.



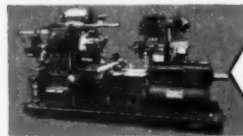
4D AUTOMATIC
Swing over bed, 21". Swing over cross slide, 9 3/4". Spindle speeds up to 696 r.p.m.



5D POWER-FLEX AUTOMATIC
Three sizes — standard, elevated or long travel. Swing over bed, 30". Swing over cross slide, 17". Spindle speeds up to 610 r.p.m.

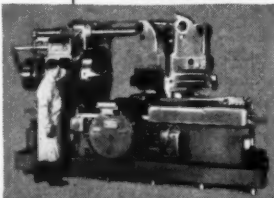


5D-2 POWER-FLEX AUTOMATIC
Two-spindle machine made in 2 sizes. Spindle center distance of 9" or 15". Spindle speeds up to 615 r.p.m.



6D AUTOMATIC
Two sizes, standard or long travel. Swing over bed, 34". Swing over cross slide, 21". Spindle speeds up to 304 r.p.m.

ANNOUNCING NEW POTTER & JOHNSTON 10DX AUTOMATIC LARGE CAPACITY — HEAVY DUTY



SPECIFICATIONS

Swing over Bed Ways	48" Dia.
Swing over Cross Slide (for chucking)	38" Dia.
Swing over Cross Slide (for machining)	27" Dia.
Turret Travel	32"
Cross Slide Travel	8 1/2"
Spindle Nose, American Standard	1 1/2" Type A-1
Spindle Speed Range (Semi-High Speed)	11 to 248 RPM
Horsepower	75 max.
Net Weight, approx.	37,000 lbs.

*Can be increased to 36" for special applications.



Numerous examples of cost saving P&J Precision Tooling on P&J Automatics are shown in this free booklet. Write for your copy.

POTTER & JOHNSTON CO.

PAWTUCKET, R.I., U.S.A.
Divisions of PRATT & WHITNEY
Divisions of General Motors Company



LW

**FIRST CHOICE with those who want
HIGH QUALITY, HIGH SPEED**

POWER HACK SAWS

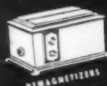
ONLY
\$283⁰⁶



Stops automatically on completion of cut. Automatic relief of saw blade on non-cutting stroke. 6" x 6" capacity using 10" x 14" blades. 12" x 3" clutch pulley. Pulley speed 120 r.p.m.

Coolant pump base. Swivel vise for angle cuts. All steel welded base and table. V-belt drive. Rigid frame. Gravity feed. Length gauge. Expanding clutch. 3-speed (90 to 130 r.p.m.) V-belt motor drive arrangement, \$29.31, less motors. 1/2 H.P. 1725 r.p.m. motor recommended. Completely Motorized with Switch; Single Phase \$375.74; Three Phase \$382.53.

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



DEMAGNETIZERS



MAGNETIC CHUCKS



DIVIDING HEADS



BELT PULLEYS



DEMAGNETIZING SWITCHES



LATHE CHUCKS



UNIVERSAL CHUCKS



POWER HACK SAWS



MILLING MACHINE VISES

L-W CHUCK COMPANY

23 SO. ST. CLAIR ST.
TOLEDO 4, OHIO



Hole Location Practices

Published in the interests of greater accuracy and quality in the toolroom and on the production line by the Moore Special Tool Company, Inc., 728 Union Avenue, Bridgeport 7, Conn., builders of Jig Borers, Jig Grinders, Panto-Crush Wheel Dressers, Die Flippers, Motorized Centers and a complete line of Hole Location Accessories.

JIG BORING CUTS

Production Time 90%

It took 3½ hours to machine each of these aluminum-alloy supporting arms, used on our Moore Panto-Crush Wheel Dresser, on a boring mill. Now—on our No. 2 Jig Borer—it takes only 22 minutes per piece for lots of 100—a time saving of 90%. Hole diameters and between-centers dimensions are held to 0.0002" to insure extreme accuracy between pivot points in the wheel dresser and allow the installation of precision bearings in the holes. Read the job details at the right.

Moore Jig Borers are being used more and more on short-run production of precision work—boring, drilling, reaming and inspecting precisely located and machined holes in production parts as well as in dies, jigs and other tools.

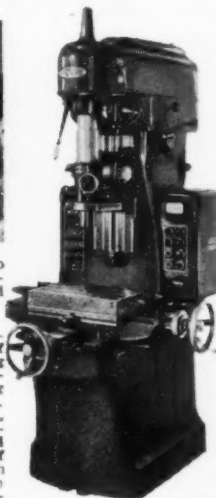
Write today for our new 24-page catalog, containing other examples of time, and cost-cutting Jig Borer operations.



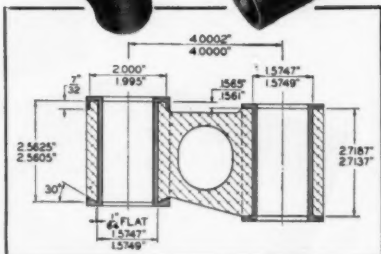
Checking hole size—held to 0.0002". Simple holding fixture provides both boring and milling positions.



Many examples of jig - boring and jig - grinding practices. 448 pages, 400 illustrations, 184 pages of Woodworth Coordinate Location Tables from 3 to 100 holes. Available at special price of \$3 in U.S.A., \$3.50 elsewhere. Send check or money order to Moore Special Tool Company, Inc., Bridgeport, Conn.



No. 2 MOORE
JIG BORER



Two holes, three flat and one beveled face and shoulder on one boss (the areas cross-hatched in drawing) are all machined on the Jig Borer—in only 22 minutes.

Oper. No.	Operation Name	R.P.M.	Feed	Min.	Sec.
1	Load and mill ribs — Single Point fly cutter	1000	H	1	00
2	Set Up and rough bore — two holes	2000	.0015	2	10
3	Rough face two top surfaces — Single Point fly cutter — Remove part to cool —	1000	H	1	35
4	Load and second rough bore two holes	2000	.003	1	50
5	Finish bore two holes	2000	.0015	2	40
6	Check two holes for size			1	00
7	Rough and finish 30° bevel	800	H	3	00
8	Rough and finish one bottom face	800	H	1	00
9	Finish face two top surfaces — Out-feed chuck	800	.0025	4	35
10	Rough and finish 2" diameter shoulder	400	H	3	00
TOTAL TIME				21	50

3 pictures
tell the
story...



JIFFY PADDED SHIPPING BAGS

JIFFY SHIPPING BAGS are used extensively to ship precision parts and instruments, highly finished or machined parts, accessories, hand and machine tools and similar items.

Three pictures—the 3 basic steps for speedy packing, tell the entire story of the **JIFFY PADDED SHIPPING BAG** for profitable, dependable and speedy shipping.

STEP 1 INSERT

Simply insert into the bag the item to be shipped. No boxes to set up—no fuss—no bother.

STEP 2 CLOSE

Fold over top of bag. Staple or use gummed tape. No strings, fancy closures or special "know-how" needed.

STEP 3 TAG

Affix label and postage. Package is now ready for shipment.

JIFFY PADDED SHIPPING BAGS are made from strong moisture-resistant kraft with built-in "expansion" cushioning, which protects shipment from moisture, abrasion, dirt and damage during transit.

JIFFY PADDED SHIPPING BAGS are perfect for packing orders in advance, for expected orders and samples. They are ideal for C.O.D. shipments.

Available in 7 standard sizes

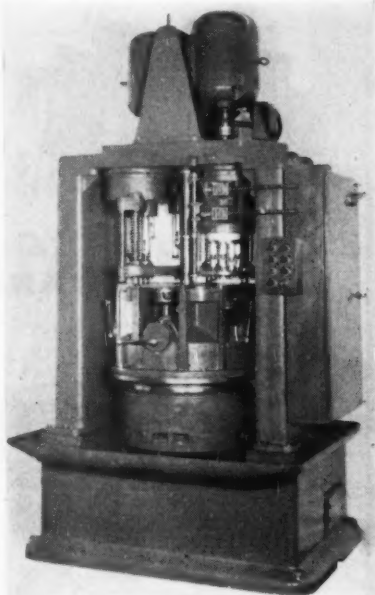
FREE
SAMPLES ON REQUEST



JIFFY

manufacturing company

360 FLORENCE AVENUE • HILLSIDE, N. J.



HIGHER OUTPUT LOWER COSTS

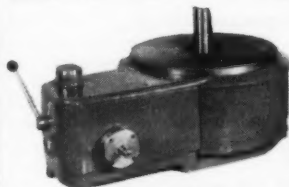
with the

FEEDEX

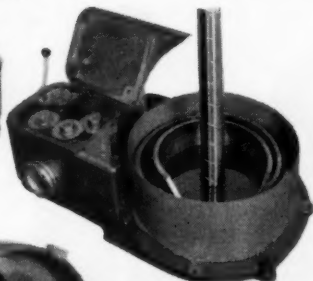
Where high production and low costs are essential you will find the FEEDEX machines producing parts of all types and shapes. It runs continuously, has an automatic cycle of rapid approach, feed, rapid return and index. It is made to index from 2 to 12 positions with 360°. The 16" FEEDEX has a thrust capacity of 6000 lbs. and the 24" of 9000 lbs.

The FEEDEX is an ideal machine for multiple operations of drilling, redrilling, counterboring, rough reaming, finish reaming and tapping.

Parts being machined are usually automatically clamped. Write for full information today.

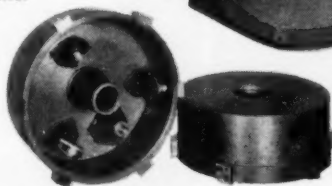


(1) Completed transmission case and rotary table on which fixtures are mounted.



(2) FEEDEX transmission, showing circular cam face assembly and hardened center die post.

SIZE . . .
5'x5'x8'
WEIGHT . . .
complete
machine
4 Tons

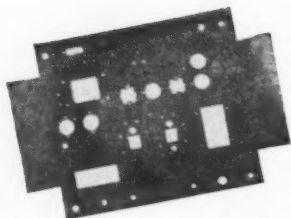
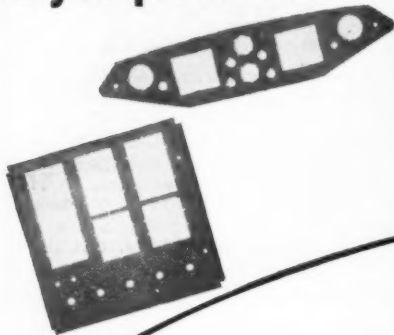


(3) Inside and outside views of FEEDEX table. Note the index blocks on outer periphery; also ballbearing rollers which ride on faces of the 3 circular cams.

Write for
complete
data today!

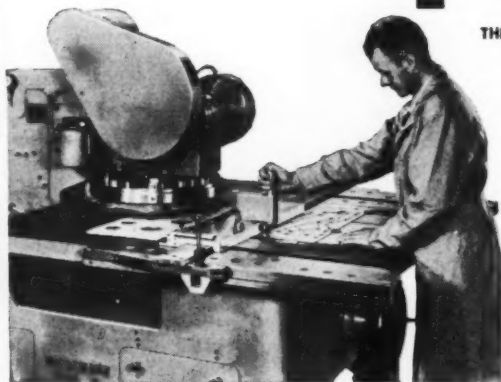
KRUEGER-BARNES CORP.
1469 E. GRAND BLVD. DETROIT 11, MICH.

if you produce...



SEE WIEDEMANN

Bulletin 241 describes the most efficient method of producing chassis and similar work in short runs and semi-production runs. Repeat runs of 5 to 1,500 pieces and single runs of 50 to 5,000 pieces are economically produced on the Wiedemann RA-41P. Write today for bulletin 241.



THE WIEDEMANN METHOD permits you to: (1)

Keep up with engineering changes without materially affecting production schedule; (2) Keep tool inventory low; (3) Produce quantities in accordance with sales requirements; (4) Produce accurate work with inexpensive tools.

"THE WIEDEMANN METHOD" through the elimination of expensive punch and die set-up and work location methods, provides an efficient means of piercing single pieces, and semi-production runs, regardless of repeat frequency.

Machines available for piercing sheet and plate up to $\frac{1}{2}$ " thick, up to 120" wide x 200" long.

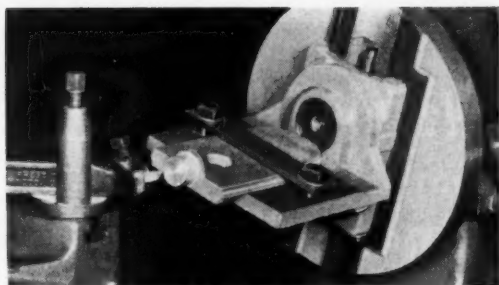
Wiedemann

TURRET PUNCH PRESSES

WIEDEMANN MACHINE COMPANY

4265 Wissahickon Ave., Phila. 32, Pa.

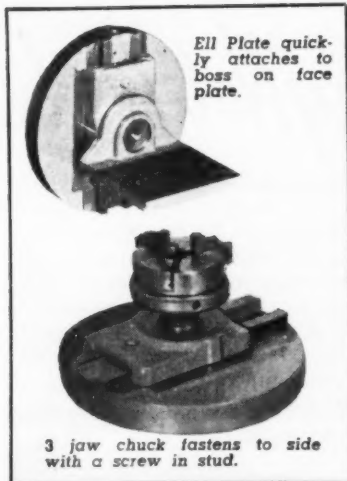
This **MICRO LATHE PLATE**



**Adjustable Slide on Face Plate
Centers Work Quickly**

***Saves* TIME and WORK**

Converts your lathe into a boring mill in 60 seconds!
Enables lathes to do offset turning, or bore three holes
not in line, without removing work piece.



*Ell Plate quickly
attaches to
boss on face
plate.*

*3 jaw chuck fastens to side
with a screw in stud.*

Ell Plate, 3 jaw chuck and MICRO
FACE PLATE equip your lathe to do
work that formerly required three or
more machines.

MICRO LATHE PLATE, INC.
CLEVELAND 13, OHIO

This MICRO FACE PLATE has boss on an
adjustable slide. Ell Plate or any special
fixture locks to boss quickly. By moving
slide across face plate and rotating fix-
ture on boss, any point of work is brought
in exact spindle center.

Boss saves bolting Ell plate to face plate.
Work can be clamped to fixture in ap-
proximate position without taking time to
locate it accurately.

In 60 seconds your lathe is ready to ac-
curately machine odd shapes and do off-
set work.

MAIL COUPON FOR CIRCULAR

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1265 West 2nd Street
Cleveland 13, Ohio

Please send circular describing Face
Plate, Ell Plate and Three Jaw Chuck.

Name

Address

City State

Want to reduce
your TAP BILL
50%? 59%?
— even 75%?

BLAKE
TAP SHARPENING
EQUIPMENT
DOES THIS
FOR OTHERS



No. 4 in a continuing study
of Tap performance records made
by users of Blake Tap Sharpening
Equipment.

TAP PERFORMANCE

Before Sharpening Tapping to Class No. 3 fit a 7/16-27 L.H. thread in brass-3/16" deep blind hole. Operation performed on automatic screw machine with average standard 3 flute commercial Grd. tap. No. of holes: 3000.

After Sharpening on Blake Equipment Tap reground with plus 5° hook in flutes increases average holes per grind to 18,000 — an increase of over 600% per grind. Average six grinds per tap before it is discarded as too small or too short in thread length. Total holes per tap — 108,000.

Why Not You!

To get dollar-for-dollar value from your taps, you *must* sharpen them just as you do other cutting tools. The Blake Flute Grinder and the Blake Chamfer Grinder provide you with fast, accurate, and economical means for grinding straight flutes, spiral points, and the chamfered ends of your taps — a sure means of reducing your tap bill. Investigate today.

Ask for Bulletins 549 and 649

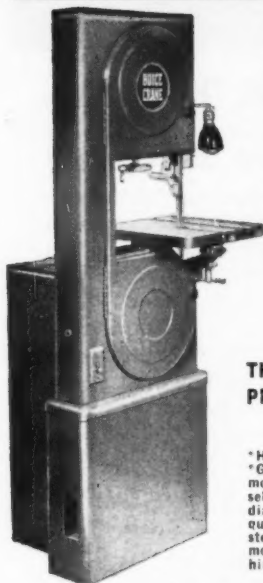
EDWARD BLAKE COMPANY

Black Diamond Precision Drill Grinders . . . Waltham Cutter Sharpeners . . .
Waltham Thread Milling Machines . . . Surface Finish Standards.



440 CHERRY ST., WEST NEWTON 65, MASS.

UP PRODUCTION AS MUCH AS 1000%
with the first low-priced, medium size
COMBINATION CONTOUR SAW AND BAND FILER!
CUTS • FILES • GRINDS



Produces maintenance parts, short run production parts, metal templates, special wrenches, wrench templates, cams, spiral parts, irregular shaped stacked parts, and stamping, forming and trimming dies in minutes instead of the hours required by old methods involving milling, shaping and hand filing. Does precision filing, file broaching and flash removal in one-ninth the time required by hand and one-fourth the time required by reciprocating filing machine.

*Solid welded steel frame. *15" x 15" ribbed cast work table. *Improved guide design sharply reduces blade costs. *Handles blades 3/16" to 3/4". *File bands come in 1/4" and 3/8" widths, two shapes, six cuts. *8 speeds, from 92 to 4100 blade f.p.m. Chart, mounted on machine, shows correct speed for accurate inside, outside and contour sawing of all industrial materials.



THE ONLY HEAVY DUTY 15-INCH DRILL PRESSES WITH 5/8-INCH DRILLING CAPACITY
— THE BOICE-CRANE SERIES 2600 —

*Heavy box-type helmet head. *50% thicker column. *Guaranteed closer tolerances wherever it counts. Much more accurate than ordinary 15-inch drills "built to sell at a price." *20% larger quill, actually 2 1/16" dia. *Up to 50% more bearing against side thrust on quill when deep hole drilling and routing. *Rugged steel (not die cast) 6-tooth splined drive sleeve. *Far more sensitive, powerful quill feed. *Quick acting hinged belt guard.

Boice-Crane doesn't try to build the cheapest — but rather the finest intermediate capacity tools at a price only slightly more than that of less accurate, limited capacity, flimsily-built machines.

50 HIGH & SLOW SPEED BENCH & FLOOR MODELS;
1-2-3-4 SPINDLES

*5 speeds—25% greater range. Easy speed changing. *Various options on work tables. *Heads and parts sold separately for special setups. *Full line of accessories, tapping heads and foot feeds.

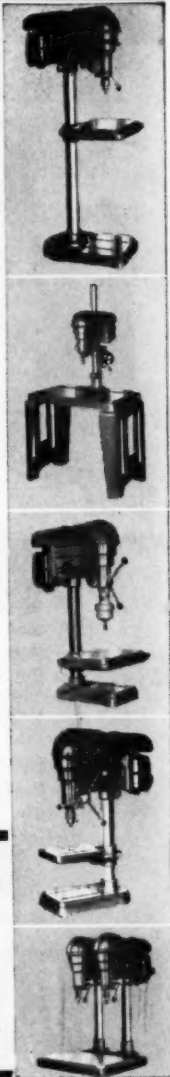
Boice-Crane also offers a 15-inch light duty drill press line in 12 models at a popular price.

Prompt Delivery Through Industrial Supply Distributors.

BOICE-CRANE COMPANY
 936 CENTRAL AVENUE TOLEDO 6, OHIO

Please send () Boice-Crane Drill Press Catalog; () Boice-Crane Band Filer Brochure; () Boice-Crane Woodworking Power Tool Catalog.

NAME
 FIRM
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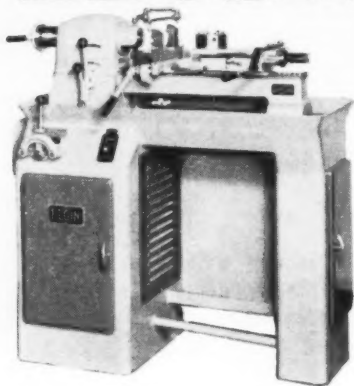


ON SMALL DIAMETER

ELGIN

Precision Parts

WILL MACHINE THEM



Elgin Knee Hole Type Hand Screw Machine

Variable speed range, 120 to 3800 rpm. 9" swing. 1" collet capacity. Collet rack inside of motor compartment door. Independent coolant system (5 gal.) mounted in rear, outside — cleaner, more accessible.

Elgin Vertical Bench Milling Machine

Preloaded ball bearing spindle. 9/16" collet capacity. Five speeds ranging from 400 to 4000 rpm. Vertical travel of spindle, 1 3/4". Table 4 1/2" x 18". 90° swivel each side of center line.

Faster: More Accurately

If your production problems depend on the speed with which small parts are machined, an ELGIN may be your answer. The line of ELGIN High Speed Precision Bench Tools is designed to pay you dividends in better machining results, faster production and greater versatility. Write for specifications, prices.



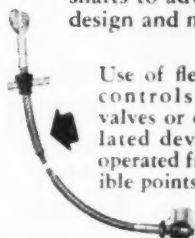
ELGIN TOOL WORKS

1772 BERTEAU AT RAVENSWOOD AVE. — CHICAGO, 13 ILL.

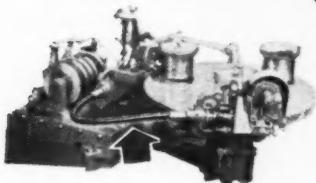
IDEAS for you

..... in these uses of *S.S. White* Flexible Shafts

The applications shown here may suggest ways in which you can use S.S. White remote control and power drive flexible shafts to advantage in the equipment you design and manufacture.



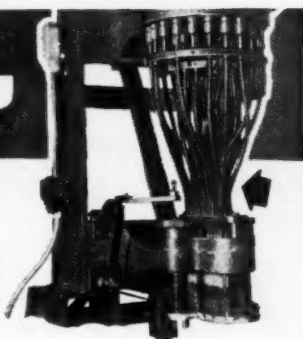
Use of flexible shaft controls permits valves or other regulated devices to be operated from accessible points.



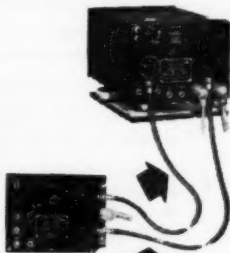
Use of flexible shafts to carry power around turns saves parts—eliminates the need for accurate alignment.



Use of flexible shafts to drive portable tools reduces the weight the operator has to handle — allows the driving motor to be slung across the operator's shoulders or mounted on a bench or stand.



Use of flexible shaft spindles increase the versatility of this drill press — allows quick regrouping of the spindles to meet different drilling requirements.



Use of flexible shafts to provide remote control between two units allows each unit to be located where desired.

WRITE FOR BULLETIN 5008

It gives essential facts and data on flexible shafts and tells how to select and apply them.



THE *S.S. White* INDUSTRIAL DIVISION
DENTAL MFG. CO.



Dept. H, 10 East 40th St.
NEW YORK 16, N. Y.

Western District Office • Times Building, Long Beach, California

Pannier Steel Stamps

LAST LONGER ... MARK BETTER

7 REASONS WHY:

1. High tensile tool steel, for durability.
2. Rounded head distributes hammer blows more evenly for better impressions, less "mushrooming," longer life.
3. Character and size plainly stamped on front for quick, easy identification.
4. "Master Marker" trademark for guaranteed replacement.
5. Rounded shank edges for comfortable use.
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7. Bevels scientifically angled for clearer stamping, longer life. Outer bevel extends beyond inner bevel depth; prevents breakdown of character face.

Use Pannier "Master Marker" Steel Stamps for a long life of clean-cut, legible impressions. Write for complete listing of styles and sizes.



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"MASTER
MARKER"**

Products

- Steel Dies
- Rubber Dies
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- Branding Equipment
- Marking Inks
- Metal Tags & Badges
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THE PANNIER CORPORATION

203 Pannier Building

Pittsburgh 12, Pa.

FEATURED IN THIS ISSUE • FEATURED IN FE

Tooling for automatic riveting	123
Clamping irregular pieces	128
Tax amortization	183

Washington news letter, by Arnold Kruckman, Washington correspondent.

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How's business? Page

Ingenious accessories speed automatic riveting . . . reduce rejects, by Frank Charly. A discussion of the modern methods of riveting as accomplished at the Los Angeles plant of North American Aviation, Inc. New economies are being realized by means of the ingenious devices now used to execute the great variety of riveting in a continuous cycle of operations. Page **123**

The clamping of irregular work pieces, by Paul Grodzinski, A.M.I., Mech. E. A survey of the manifold types of work-holding vises, as outlined by this internationally-known authority. Several solutions to the clamping problems brought about by irregular-shaped work pieces are presented, of considerable practical help to shop and maintenance men. Page **128**

Special Report of Lathes . . . Part 2. A continuation of the series of special reports being offered monthly by the Machine and Tool Blue Book. Due to the large number of American lathe manufacturers, this series will appear in three parts, with the third and final section to follow in the September issue. Included in this month's special report:

Adjustable stops add efficiency to engine lathe operations. Page **137**

Description of late model lathes. Page **140**

Specifications of American-built machines. Page **150**

New machine mills aircraft skin panels from solid or rough-forged aluminum alloy plate. The new Giddings & Lewis Hypro Aircraft Skin Mill, Type 100, stated to be the largest machine ever to be equipped with tracer

controls, is herein described, including its three-dimensional operation, complete specifications, machine drives, etc. Page **171**

Five-year amortization, or the tax education of Joe Jones, by Irving S. Olds. This recent speech, delivered before the annual meeting of the Chamber of Commerce of the State of New York, on the "rapid amortization" section of the 1950 Revenue Act, should clarify the controversial five-year amortization section, as well as eliminate the popular belief that industry is getting a tax subsidy from the government. Page **183**

Producing M-47 General Patton tanks at Baldwin-Lima-Hamilton, Page

Available literature. Page

New books. Page

News of the industry. Page.....

Foremen are key to making production planning productive, by Edmund Mottershead. This article continues the author's series of special presentations dealing with the problems of manpower and industrial relations. Eight factors of production planning are discussed, clarifying the various functions of the planning task, particularly as they affect foremen. Page **243**

Professor Rechiard's quizzes. Page 246-276

Four steps in maintaining better quality, by Ralph B. Bryan. Page

A tapping fixture of welded construction, by Robert Mawson. Page

Shop Hints. Page

Modern tools in action. Page

What's new in metalworking? Page

Mechanics through the ages. Page

Products index. Page

Index to advertisers. Page



sound

Investment

This user gets more production per dollar invested, by replacing old type equipment with a modern SUPER SERVICE Radial.

Operators and maintenance men alike find no trouble in keeping this SUPER SERVICE Radial Drill at peak efficiency.

Leading manufacturers realize that the SUPER SERVICE Radial will produce the required results on large or small parts alike.

At the Norwood Works of the Allis-Chalmers Manufacturing Company, this Cincinnati Bickford 13" diameter column SUPER SERVICE Radial is drilling mounting holes in open slot stator cores. Table extension base on this machine readily facilitates the processing of small work. The head is merely positioned over the table for the small work, or swung over the base for the larger parts. From the eighteen feeds and thirty-six speeds, the right combination is always available for the drilling, tapping, reaming or boring tool involved. Write for Booklet R-29, which will give you more detailed information as to why the SUPER SERVICE Radial commands the respect and admiration of both shop and management.

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.



Got any old planers, tug-boats, or locomotives?

If you have, and they are obsolete and useless, turn them in for scrap and write them off inventory. The steel scrap situation is reaching a dangerous state and if continued high steel production is to be maintained, every corner and nook and cranny of America's factories must be combed and searched with flashlight and candles for useless equipment, jigs, tools, fixtures, wire, bars, and other stock for which there is no use except to take up room. This steel should go into steel scrap.

Several steel companies have less than two weeks inventory on hand; some only a few days supply; others have already lost some production, either through downtime or because the use of inferior grades of scrap has not permitted maximum output per ton of raw materials used.

The present drive for steel scrap is not a household drive like some conducted during World War II. You don't have to sacrifice your garden furniture, lawn mower, or take the fillings out of your teeth, that will come later. The steel scrap that is needed now is the heavy industrial kind which every shop has in quantity, if it is hunted down.

Here's just one example of what happened during World War II when industries which would not ordinarily be thought of as producing a big volume of scrap really got to work on the job: The Eastman-

Kodak Co. would certainly not be considered a prime producer of scrap, yet during a World War II scrap drive, Eastman found around its plants 88 carloads of dormant scrap within a 3-month period. Ever since that experience, the Eastman Co. has had an alert procedure for removing obsolete equipment from inventory on a regular basis.

Here is a 4-step program to help the collection of scrap in your organization:

1. **Go after dormant scrap with an emergency inspection** and an inventory of all heavy steel.
2. **Keep scrap flowing** by organizing clean-up committees which funnel scrap to the steel mills. Scrap will always be needed, and in the future in even greater quantities than today.
3. **Make salvage a top management responsibility.** If business is to get the steel it needs in the years to come, every management executive must help to keep scrap flowing.
4. **Put scrap collection on a housekeeping basis.** Besides increasing the steel supply, continuous scrap recovery of obsolete machinery and equipment reduces taxes through inventory write-off, improves safety conditions.

Let's really get into this scrap with scrap.

William F. Schleicher

Save up to 500 Gallons Per Hour!

New ROSS "Water-Saver" Valve CUTS COOLANT COSTS!



Instant Cut-Off Assured

Now waste of expensive coolants can be eliminated . . . their use confined to required periods!

The Ross "Water-Saver" or Time Delay Valve is the answer. It turns on the coolant and lets it run when needed . . . then automatically shuts it off. The flow can be maintained for any period from 3 seconds to 3 minutes after the machine cycle.

Operation of the valve is entirely automatic. No electrical or mechanical motivation is required since it is activated by cylinder pressure.

The Water-Saver Valve is a straight-way or shut-off model, normally open or closed to water supply, and is available in $\frac{1}{4}$ to $1\frac{1}{4}$ pipe sizes.

Get complete details today . . . no obligation whatsoever.

*Ask Ross for Any
Air Control Information*

Ross makes valves only—hundreds of types and sizes. Take advantage of the experience gained in over a quarter century of concentration on design and application of air power.

ROSS OPERATING VALVE COMPANY

120 E. GOLDEN GATE AVE., DETROIT 3, MICHIGAN



by Arnold Kruckman

Washington Correspondent



Machine tool people have urged OPS immediately to adjust price ceilings. New regulations promised late June or early July. They ask help in getting skilled workers, in financing, in procuring raw materials & priorities for plant expansion, & special machine building. Government reports machine & tool industry now has backlog well in excess of a billion dollars. NPA states industry has increased production only 25%, but must increase 100% by fourth quarter,--October, November, December. Washington asserts industry needs more big capital for materials, engineering, payrolls, plant expansion & parts purchasing. During third quarter, with anticipated CMP inflation, imported metals are expected to cost more, especially those from Mexico and Canada. Obsolete & worn machinery is expected to be increasingly discarded.

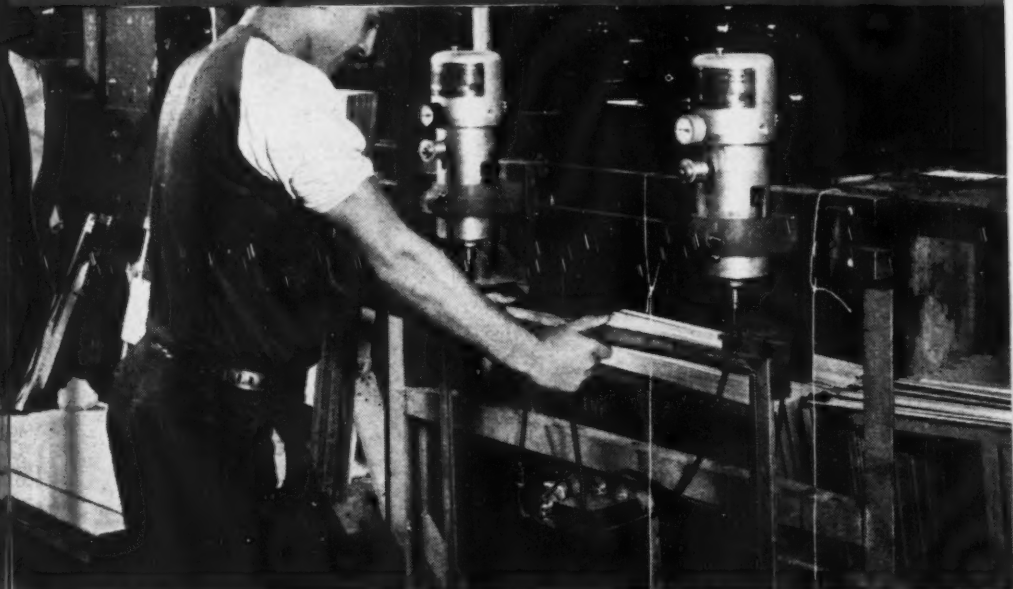
* * *

National Tool & Die Manufacturers Association told the Senate Banking Committee wage stabilization discriminates grossly against small concerns without wage contracts with big unions that permit escalator cost of living increases, or merit increases. The Association told the Senate Banking Committee "if cost-of-living pay increases are warranted to one group of employees, they must be allowed at the same time to any other group where the employer can & will grant the." United States Chamber of Commerce asked "indirect controls" . . .

* * *

Government stockpiling is more moderate and has eased pressure on markets & supplies. . . . Bureau of Mines reports taconite & jasper, lowgrade iron ores, will be under development in the Mesabi country for reserves in emergency. Billions of tons are located in an area extending over 100 miles, several miles wide, to a depth of several 100 feet. Three tons rock produce one ton of concentrate. . . . Nickel is reported to be the scarcest of the alloy metals. Canadian mines underproducing by reason of shift from strip to underground mining. Tungsten, next, formerly supplied by China, now comes from Mexico, Africa, Spain & some from England. Platinum, also very scarce, by-product of nickel, originally supplied by Russia, now comes from Canada & some from Europe. Supply of stainless steel, & other alloy steels in industrial warehouses, is under 40%.

\$

10440**saved
per year**

by 2 DUMORE DRILL HEADS

The F. C. Russell Company, Cleveland, world's largest manufacturers of combination screen and storm sash, hooked up 2 Dumore Automatic Drill Heads in gang to drill insert strips of mild 0-25 Armco Zincgrip, rolled from ingot iron. Savings were immediate and spectacular. Costs per 100 strips dropped 75%, from \$23.00 to \$5.60, for a saving of \$10,440 per shift year.

13 months drill savings pay for the 2 DRILL HEADS!

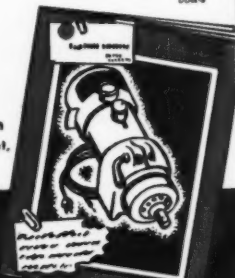
The \$10,440 production saving is "gravy" according to F. C. Russell tool engineers because drill savings run \$340 per year . . . completely pay for the 2 Dumore units in 13 months use. They particularly like the

fact that drill feed, speed, pressure and stroke are automatically controlled, and that gang operation and remote control foot switch step up production.

If you're using No. 80 — 1/4" drills, it will pay you to investigate the high-speed Automatic Drill Head. Call your Dumore Distributor today for a demonstration in your own plant. Write us today for free 16-page bulletin.

**THE
DUMORE
COMPANY**

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Export Address: 13 East 40th Street,
New York 16, N. Y., U. S. A.



Tool post
Grinders

Handgrinders

Router

High Speed
Drill Press

Quills

Flexible
Shaft
Tools

. . . Duty of 2¢ a pound on copper was suspended by law May 22. Law lapses February 15, 1953, or, when price of domestic copper falls below 24¢ a pound. . . . New aluminum production is expected to be around half billion pounds. Aluminum defense users, under no restraint, are piling up stockpiles, ordering for 18 months ahead. . . . Wage contracts at many large copper mines expire June 30. Many question what will happen. . . . President has ordered release, from Government stockpile, tungsten, cobalt, columbium & other scarce items, to break critical production bottlenecks. He says action especially necessary to provide high-temper alloys for retooling. He acts upon recommendations of the President's Vital Materials Coordinating Committee.

* * *

CMP has usual Government travail getting started. Charles E. Wilson, Defense Mobilizer, & Eric Johnston, Economic Stabilizer, don't mix well. Johnston likes to talk things out; Wilson is terse, impatient & abrupt. Commerce Secretary Sawyer hates to surrender anything Commerce Department possesses. The three are in disagreement about jurisdiction over CMP, now under DPA. DPA, in effect, is a fifth wheel on the defense vehicle. All agree it should be abolished, but disagree where its functions should go. Logic would take it to NPA. Administrator Fleischman would welcome authority over CMP, but his Agency is understaffed—it now has only 3000. WPB, earlier operator of CMP, had 20,000. NPA coyly hopes it can get along with 10,000; but fears CMP is a task that will make more personnel imperative. Congress, meanwhile, ruthlessly is cutting off 250,000 to 500,000 Government employees. . . . Truman doesn't want anything like the old WPB. He is again caught in a personality conflict. He will soon have to choose between Wilson & Johnston. Meanwhile several Harvard Business School experts on governmental organization are making a study of the whole mess. It is hoped their report will solve the problem of the future of DPA, NPA, & CMP, early in July. Transfer of DPA to Commerce Department also has aroused active opposition from Interior Secretary Chapman & Agriculture Secretary Brannan, which takes the fight into the Cabinet. Meanwhile DPA is actually bogged down on CMP. Officially, CMP starts July 1 but wrangles will keep its feet dragging considerably during the initial period. Field offices report situation is intolerable because order from NPA, DPA & Commerce conflict & increase business men's burdens.

* * *

Secretary Acheson is responsible for statement that \$300,000 worth of machine tools we gave France enabled Frenchmen to produce over \$14 million worth of airplane frames. The machine tools were ECA gifts. . . . Canadian Embassy here states a number of makers of machine tools are the principal participants in the International Trade Fair at Toronto this year. . . . Turkey offers great opportunities for tool industries and

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This machine sharpens cutters and tools better and more accurately, making them last far longer. The No. 12 is easy to set up, easy to operate and easy to control to closest tolerances. Efficiently covers a wide range of operations.

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Two speed longitudinal table control
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**WRITE FOR
BULLETIN
MT81**

COVEL GRINDING MACHINERY SINCE 1874
INDUSTRIAL GRINDERS
COVEL MFG. CO., BENTON HARBOR, MICHIGAN U. S. A.

light metal-working industries according to the International Bank for Reconstruction and Development report of its Mission recently. Turkey has a business-like Commercial Mission in Washington. . . . Pentagon states major metal working companies are receiving sub-contracts approximately 500% to 600% greater than earlier in the year. Prime contractors are placing orders for materials and parts for delivery from next December to April, 1952. Some sub-contractors are producing 200 to 300 units instead of 1 to 3 as was customary during the first quarter. Government reports indicate tool work has increased 400% to 500%, compared to last December or January. . . . Pentagon has asked Congress for permission to build & operate its own arms factories, including guided missiles & other weapons. Program includes machine tools to produce arms. . . . W. O. Metcalfe, Head, NPA Small Business Pooling Division, says NPA neither encourages or discourages pools, simply advises any group what they must do to be saved. Pamphlet with this philosophy now going to the various Government agencies. Pamphlet emphasizes there is not enough defense business to meet demand by industry. Innumerable plants are seeking business. . . . ECA has issued a 66-page book, like a mail order catalogue, to show what the law prohibits for shipment to countries trading with Russia and its satellites. Thirty-one hundred categories each list thousands upon thousands of items, ranging from machinery to women's clothing. Truman wants the law repealed. ECA Administrator Foster intimates the law will not be enforced.

* * *

Army needed scrap. New Jersey corporation had purchased 8-mothball ships. They lay in the Wando River near Charleston, S. C. Federal Government gave own two hours' notice to surrender the ships. At expiration of the period Army forcibly boarded the ships, took possession, & its agents towed them to the Baltimore Yards of the Bethlehem Steel Co., for scrapping. One employee of the corporation refused to leave the ship. He was put off at Baltimore, & arrested as a vagrant because he had only small change. He was kept in jail until rescued by the corporation. It secured an injunction to restrain the Federal Government & the Bethlehem Steel Co. from destroying the ships. The case is now in the District of Columbia Courts, before the same Judges who sentenced Commerce Secretary Sawyer to jail for contempt in the Dollar Line case. The Sawyer contempt proceeding has been stopped until fall by action of the U. S. Supreme Court. Bethlehem Steel also is involved in the incident before Congress concerning the steel allocated to General Motors for the building of locomotives while the application made by the Badwin Locomotive Works, & others, were mysteriously lost. Colonel William G. Knight revealed the incident to the Congressional Committee. After Melvin Cole, Vice President of Bethlehem Steel, loaned to NPA, without salary, was summoned before the Congressional Committee, & interrogated about the incident, Knight was forced to resign from NPA.

This ad....

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to a.....

HELP WANTED
Wanted: Company to design and build shell loading hydraulic presses. Must be fast, efficient and engineered for safety. World War II experience preferred.



If we saw the above ad in tonight's paper, we'd reach for the phone . . . quick! The job's made to order for K. R. Wilson. Hundreds of KRW 2-station and 4-station shell loading presses were supplied to bomb loading contractors during World War II. The photo at left above shows a close-up of the shell case holder on a KRW 4-station shell loader (shown in inset). At right is a battery of KRW presses in one of the nation's largest arsenals.

We're set to do an even bigger job today. Almost two million dollars in new machinery and equipment have been added to our plant since World War II. So if you have shell-loading contracts, contact KRW for the right equipment.

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Send for FREE NEW BOOKLET

It tells all about our plant, equipment, facilities and experience in war and peace-time production. It's yours for the asking. Write Dept. 12.



AUGUST, 1951

MTBB

HOW'S BUSINESS? • HOW'S BUSINESS

HOW'

General business indicators

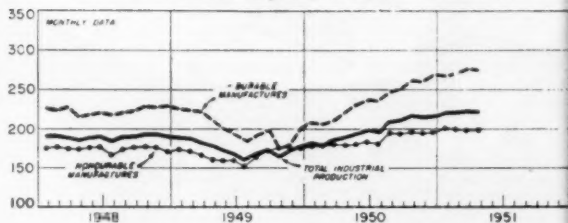
source: Dept. of Commerce

Industrial production

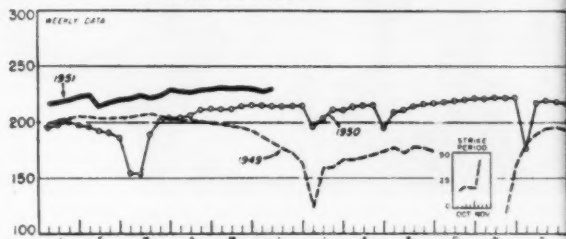
(Seasonally adjusted, 1935-39=100)

Labor in machine tool industry

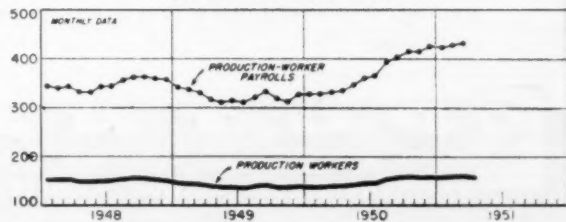
Employment in the machine tool industry has been rising steadily and rapidly since the outbreak of the Korean hostilities. The nation's 300 machine tool plants employed more than 70,000 wage and salary workers in February, 1951, nearly 50% more than in May, 1950. Thousands of additional workers will be needed to meet production goals during 1951 and 1952.

**Steel ingot production**

(1935-39=100)

**Manufacturing employment and payrolls**

(Unadjusted, 1939=100)

**Work Week**

A lengthened workweek accompanied expanded employment. From an average of 41.8 hours in



MORE THAN EVER! Today's demand for quality end mills has developed into an unprecedented volume at Putnam—the end mill specialists. And, because Putnam's first consideration is quality, inspection facilities have greatly increased. If you want end mills with proven performance, call on Putnam.



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May, 1950, the average workweek has been lengthened to 47.3 hours in February, 1951, the highest average of any manufacturing industry. A December, 1951, survey indicates that nearly 60% of all production workers were employed in plants with scheduled workweeks of 48 hours or longer.

Earnings

In February, 1951, production workers earned on the average \$82.30 for a workweek of 47.3 hours. For all manufacturing industries earnings were \$63.76 for a 40.9 hour workweek.

Wage stabilization

The Wage Stabilization Board has 5000 applications for wage increases which exceed 10% rise over January, 1950 bases allowable under the February, 1951 formula. Washington predicts wages breached in the meat-packing case will continue to rise. Eric Johnston has made it clear that policy will be to let pay rise as living costs rise. Escalator clause, supposed to lapse June 30, will continue. It is anticipated the new ceiling will be 15% instead of 10%, by informal methods. Under cover of hardship and inequity, policy will be to hold down prices but push up wages.

Small business

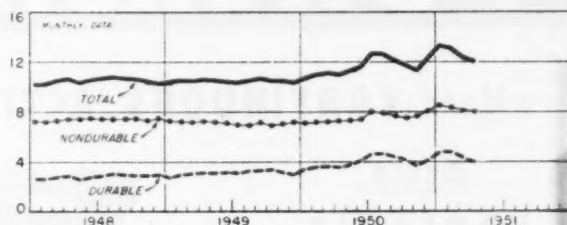
Senator John J. Sparkman, (Dem. Ala.), chairman of the Senate Small Business Committee has introduced an amendment to the Defense Production Act which would create a Small Defense Plants Corp. This would act as a centralized agency to unite and funnel defense work to small companies. The amendment has a good chance

Sales of retail stores

(Billions of dollars, seasonally adjusted)

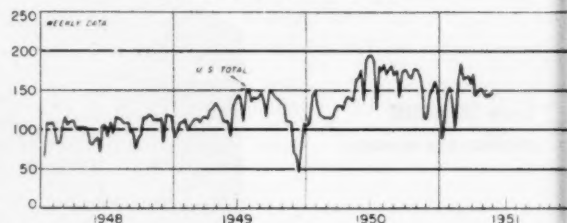
General business indicators

source: Dept. of Commerce



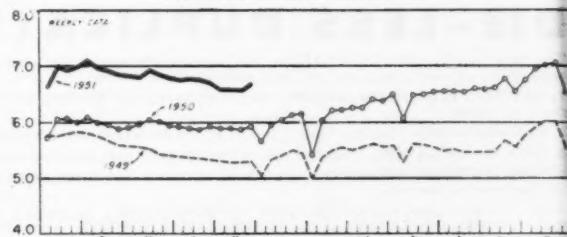
Motor-vehicle production (Passenger cars and trucks)

(Thousands of vehicles)



Electric power production by utilities

(Billions of kilowatt hours)



of being incorporated into the Defense Production Act.

Reason for the amendment is the plight of many small businesses who must either get defense work or close down. Materials are too difficult to obtain, the labor situation is critical, with many skilled craftsmen seeking work in the higher paying large

New di-acro POWERSHEAR

offers **CONTINUOUS ACTION**

plus
**VARIABLE
SPEED**

from 30 to 200
strokes per minute



for high speed

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The new Di-Acro POWERSHEAR has remarkable speed and accuracy for the production of small parts and pieces. Consider these points:

1. **CONTINUOUS SHEARING ACTION**—no clutch to engage! Feeding speed determines shearing speed.
2. **VARIABLE SPEED**—cutting cycle quickly set for each shearing operation.
3. **EASE OF OPERATION**—less fatigue, accuracy increases, production soars.
4. **"SINGLE STROKE" SHEARING**—non-repeating safety clutch for jobs not adaptable to continuous shearing.

Any plant doing high speed precision shearing on smaller parts cannot afford to be without the Di-Acro POWERSHEAR. Available in 12" and 24" shearing widths, capacity 16 gauge sheet steel. Also standard model—

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LEATHER • SILVER
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LEADED BRASS
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Other Materials



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SHEARS



**ROD
PARTERS**

plants which have defense orders. Not too many small companies have received war orders; one reason given for this lack of orders to the small companies is that the larger companies could get the job done faster.

According to Senator Sparkman, the new amendment would have the power to: take contracts and break them down for distribution among small firms; recommend RFC loans to small businesses; certify small companies to the procurement agencies for prime contracts.

OPS and advertising expense

Charges that the general manufacturers' pricing regulation and similar regulations issued by the Office of Price Stabilization will restrict manufacturers' expenditures for advertising are false, says Assistant Director for Economic Policy, Gardner Ackley.

Says Mr. Ackley, "For advertisers and advertising men to claim that the OPS regulations will squeeze advertising expenditures by not recognizing increased advertising costs is to misunderstand both the regulations and the nature of advertising.

"The purpose of these regulations is to establish ceiling prices for manufactured products that will be in sound and balanced relationship to each other and to costs.

"Manufacturers and advertising men can rest assured that no OPS regulations will be issued which will in any way restrict the use of advertising."

Automobile production

It is expected that automobile production will slow down sharply during the summer months and the balance of the year. It is expected that the half-million mark will not be reached again after current months. Defense work, now getting under way on a full-scale basis in the automotive industry, will cut deeply into passenger car output, although truck production is not scheduled to suffer the same proportionate drop in output.

NPA News

The NPA adjusted limitations on the use of a defense order rating for maintenance, repair and operating supply items to compensate for increased prices and accelerated programs. The action permits use of

the DO-97 rating for up to 120% of the amount spent on such MRO items during the base period. The limit had been 100% . . . Action has been taken to make available a larger amount of used railroad rails and used axles from locomotives and freight and rail passenger cars for re-use as scrap. The order, M-64, to restrict deliveries of used rails and axles, states: 1. After May 31 no person shall deliver or accept delivery of used rails or used axles for rolling or scrap grade in an amount exceeding 10 tons of each item in any one month; NPA will allocate the supply of used rails and axles; applications for authorization must be filed with the N.P.A.

During the past month ECA, for the Marshall Plan and the Military Defense Assistance Pact, disbursed \$165,255,972 to enable Asiatic and European countries to procure machine tools, metal working machinery, tinplate-terneplate and blackplate, and a miscellany composed of scarce copper and copper products, stainless steel sheets, high-speed steel, manganese bronze, iron and steel mill materials, steel mill products, ferrous alloys, pig iron, tin and tin base alloys, zinc and zinc base alloys and various other metal material. Total expended for machine tools was \$130,603,000; tinplate-terneplate and blackplate, \$10,133,880; miscellaneous scarce metals, \$15,002,092; copper and copper products \$11,600,000; metal-working machinery, \$7,517,000. United Kingdom received \$112,000,000 worth of machine tools to be delivered as swiftly as possible. France received machine tools valued at \$9,554,000; Italy, machine tools worth \$5,200,000; the Belgian Congo, machine tools \$200,000; Austria, machine tools \$600,000. France received metal-working machinery valued at \$3,890,000. Italy received copper and copper products and other scarce metals and products worth \$13 million. Norway was the recipient of copper and copper products, and the products of scarce metals, to a total value of \$850,000. The ECA and MDAP donations went to the Netherlands, France, Greece, Portugal, United Kingdom, Italy, Yugoslavia, Austria, Belgian Congo, Germany, French North Africa, French overseas possessions, Norway, Sweden, Turkey, Denmark, Ireland, Iceland, Formosa.



Tool Steel from Ryerson Easier to Buy . . . Safer to Use

Steel procurement is trouble enough these days without adding unnecessary steps. That's one reason why more and more metal working shops are ordering tool steel from Ryerson, their regular warehouse steel source. This way, one call often does the work of two. One order, one invoice covers tool steel and other requirements.

You can safely buy this way because Ryerson tool steel stocks meet high standards of quality. Every bar is unmistakably identified by type with full

length color marking. And with every shipment you get exact instructions on how to harden your Ryerson tool steel.

Hundreds of tons of tool steel are on hand at Ryerson plants, ready for quick shipment. Included are oil hardening steel, water hardening steel, flat ground stock—all the types described at the right. We suggest that you investigate the performance on these steels. For in addition to their high quality, Ryerson tool steels are economical in price. Call the Ryerson plant nearest you.

TOOL STEEL IN STOCK: Oil hardening RY-ALLOY, water hardening VD TOOL STEEL and CHISEL STEEL, RY-ALLOY GROUND FLAT STOCK.

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Ingenious accessories speed automatic riveting ... reduce rejects

by Frank Charity

RIVETING—the production operation which accounts for the highest percentage of the total cost of a modern metal airframe—is now being done with unprecedented economy at North American Aviation, Inc., Los Angeles, by means of General Drivmatic riveters and an unusual assortment of accessories (including photoelectric index templates, automatic rivet jigs, and electronically-controlled handling systems).

Riveting machines of the type in question are capable of enabling a machine operator to accomplish most riveting operations, aside from dimpling, in an almost-continuous cycle—which includes the drilling and countersinking of materials as well as the feeding and upsetting of rivets with flush or protruding heads. They are being used to assemble sheet panels, small channels, H-sections, etc., with widths up to

120", depths up to 5½", and lengths up to 48'.

With the North American accessories, rivet rejections have been reduced to a margin of less than one per cent and each machine can be constantly operated with maximum speed—regardless of the strength and skill of a machine operator, figures 1 and 2.

The accessories were developed by methods engineers Harold Hubbard and All Gerber, and their use involves a rather simple applicational principle that should be adaptable to the control of many other machine operations—as indicated by the following general descriptions:

(1) Photoelectric index template — comprises a sheet material, precision-drilled with the rivet pattern for each assembly. Its purpose is to project a beam of light through an aperture in the template when materials are pro-



1. Old methods of riveting aircraft assemblies . . . involved a tedious sequence of manual drilling, countersinking, reaming, hammering, and related operations — one of which required more time and skill than does a complete riveting cycle as now being done with accessories.

perly aligned for each riveting operation, so as to actuate a photoelectric cell, figure 3.

(2) Rivet jig—comprises an electrically-operated conveyor mechanism, designed to feed parts to the riveter as the parts are required for individual riveting operations, figure 4.

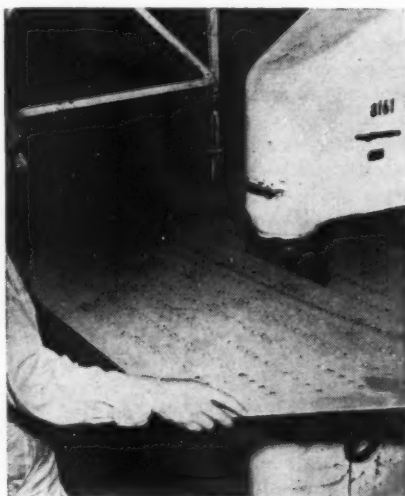
(3) Electronic controls — essentially comprise a vacuum-tube amplifier unit, similar to a small radio transmitter and receiver. Purpose of this unit is to receive electrical impulses from the above-mentioned photoelectric cell, and to convert those impulses into power—starting or stopping the rivet jig and causing the machine to go through its operational cycle each time assembly parts are aligned for a rivet.

Rivets that have been driven with these accessories are standard AN aluminum-alloy parts with brazier, modified-brazier, flat, round, button, countersink, and mushroom heads. Shank diameters ranged from $3/32"$ to $1/2"$.

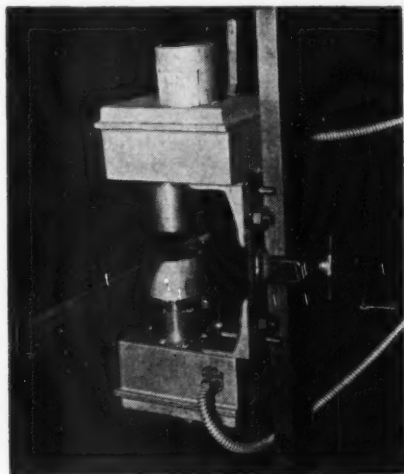
Assembled materials included magnesium as well as 75-ST and other high-tensile aluminum alloys with thicknesses averaging $1\frac{1}{8}"$ and $3/4"$.

Prior to production work with the accessories, the riveting machine is readied for use in a more or less conventional manner — by selecting and installing a suitable rivet hopper and shuttle assembly, connecting air lines for the hopper and shuttle units, loading the hopper with rivets, testing the

2. In using a riveter with accessories . . . a machine operator's principal duties consist of setting an indicator for each new row of rivets and watching a group of signal lights which glow when the equipment is functioning properly.



rivet-feed mechanisms, installing the upper and lower anvils, attaching drill-countersinking tools as needed, and us-



3. One of the photoelectric index templates . . . used to facilitate work with riveters.

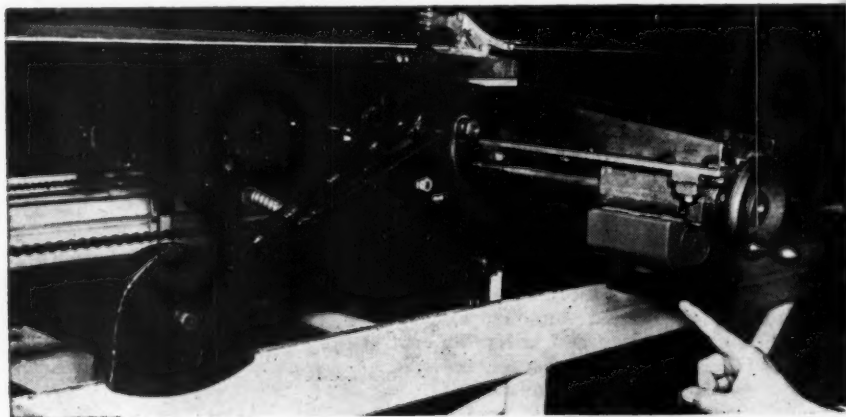
ing sample materials to test the setup by manual means, figure 5. Then ad-

justments are made to regulate the depth of cutting-tool movements, rivet height and stroke control dials are set for operation with maximum efficiency, and the master machine switch is set for the desired operation.

Next, a master toggle switch for the handling mechanism is turned on and a station-selection switch is set for the desired machine operational speed. Then, after the chip blower airline is energized, an initial assembly is readied for riveting by:

- (a) Depressing a reset switch until the lower ram descends as far as possible (about 6 inches).
- (b) Running the carriage assembly out from the right-hand side of the machine with manual controls.
- (c) Clamping the assembly in place on the carriage mechanism.
- (d) Installing the proper photoelectric index template, as shown in an accompanying illustration.
- (e) Depressing a hand switch to move

4. A portion of the rivet jig or conveyor mechanism . . . which comprises an integral portion of accessories for riveters. A finger points out the pushbutton station which is used to alter the speed of the jib and the alignment of parts thereon.





5. Basic components of a riveter . . . are assembled prior to production work much the same as they would be assembled if no accessories were utilized.

the carriage and its load into the machine.

(f) Actuating a solenoid which positions index pins, allowing free travel for fore-and-aft motions.

(g) Adjusting a time-delay switch for the handling system, if necessary, so that the photoelectric cell will be removed from an index-template hole before clamping pressure is applied by the machine for each riveting operation.

(h) Setting a flow-control valve to govern the speed of the handling system's operations.

(i) Depressing a pedal which institutes riveting operations.

A row of rivets is produced each time an assembly is moved fore or aft through the Drivmatic; and, after the initial setup is made in each case, the operator's principal duties consist of setting a rivet-row indicator for each

new line of rivets and watching a group of signal lights to make sure that the electro-mechanical components are functioning properly.

After the work is positioned for each new rivet, the following sequence of operations take place automatically:

(1) The lower anvil rises until the pressure sleeve clamps the work against the upper pressure foot (clamping pressures being sufficient to prevent subsequent defects due to burrs around drilled holes).

(2) The lower ram stops and the drill spindle moves downward.

(3) A rivet feed knife provides a rivet for the machine's feed fingers as a hole is drilled and (if necessary) countersunk.

(4) The cutting tool is removed from the hole it has produced, so that the feed fingers can position their rivet over the hole.

(5) A bucking ram descends, pushing an anvil through the rivet fingers and then seating the rivet in its hole.

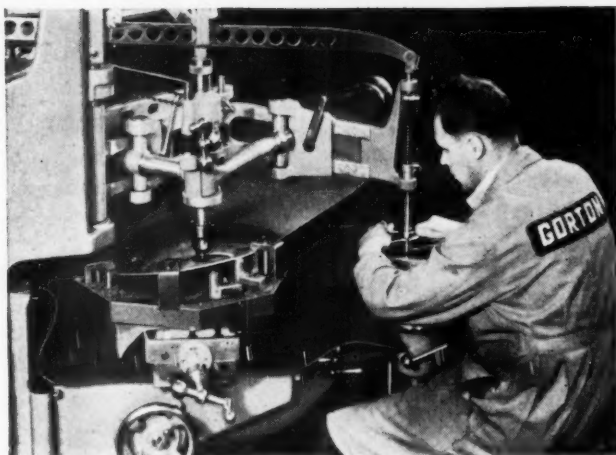
(6) The bucking ram is automatically locked in place over the rivet head, and the lower ram upsets the rivet shank to a predetermined height.

(7) The upper and lower rams are retracted and the work is conveyed to a new position, where the riveting operational cycle is completed.

With North American's accessories, these riveters are said to be virtually fool-proof — making it impossible to use the wrong rivets or to produce defective assemblies, once the equipment is satisfactorily adjusted for a given type of work.

Further, it is currently believed that modifications will eventually make it possible to perform punching and dimpling operations in addition to the operations which have heretofore been described.

The End.



Tracer-Controlled Pantograph cuts and rounds thermal slot in 8-foot steel propeller blade in 40 minutes; previous time was 5 hours, 10 minutes — just one of hundreds of examples of time and cost saving with tracer-controlled Pantograph machines.

Special Machine Tools Speed Production During Rearmament

by
GEORGE GORTON III
Executive Vice-President,
George Gorton Machine Co.

INDUSTRY'S foremost responsibility right now is to produce faster, to highest quality standards and at lower cost — whether on defense contracts or for our civilian needs.

Today, there are literally thousands of operations being performed throughout industry which can be speeded up, improved in quality and lowered in cost by the use of available models of special machine tools. The modern tracer-controlled Pantograph machine is such a tool. It is both a special purpose machine, ideal for short runs, and it is an accurate single purpose machine which turns out identical parts or pieces to meet tight production schedules.

The tracer-controlled Pantograph machine is used for inside and outside profiling, routing, die sinking, mold cutting, counterboring, contour milling, chamfering, grooving, graduating and engraving in ferrous and non-ferrous metals, as well as in plastics.

This machine performs on flat, uniformly curved, cylindrical, spherical or

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Single or repetitive accuracy — from one piece to thousands — manual or full automatic operation depending upon quantities — work sizes from the size of a dime to as large as 10 feet.

A new booklet, "Pantography," explains the process and shows what this type of machine can do for you. It is yours without obligation. Write for it today. If interested, also ask for our latest General Catalog 1655. Address the George Gorton Machine Co., 1408 Racine St., Racine, Wisconsin, U. S. A.



The clamping of irregular workpieces

by Paul Grodzinski, A.M.I. Mech.E.
London

PRACTICALLY all commercial clamping devices are arranged for the clamping of rectangular workpieces, only occasionally adaptation for cylindrical workpieces are made. While it is true, that the problem of clamping had first to be solved for work of uniform shape, the progressing development has to lie in the direction of appliances which can clamp arbitrarily irregular work-

pieces. That the commercial devices have not followed this trend to a sufficient degree, can be seen in the development of special tooling and in the increasing development of jig and fixture design.

The man in the shop would be only too eager to use any appliance for holding the workpiece which comes along instead of demanding and waiting until

1. Principle of parallel vise. 2. Vise with jaws, with vee cutouts for the alternate clamping of rectangular and cylindrical components. 3. Special jaws adapted to the particular shape of the work.

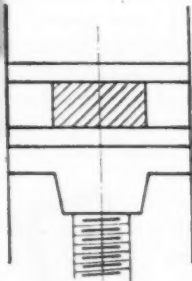


Fig.1

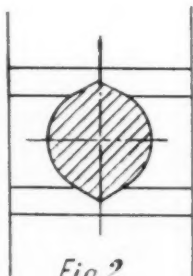


Fig.2

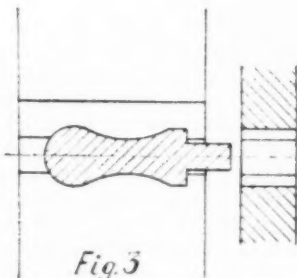


Fig.3

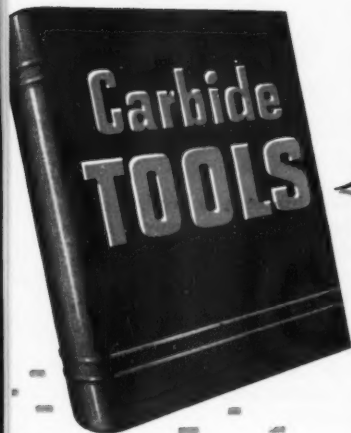
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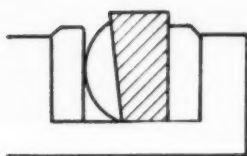


Fig. 4a

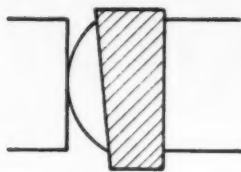


Fig. 4b

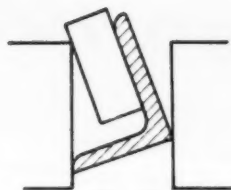


Fig. 5

4a and b. Clamping a wedge shape part by a circular segment. **5.** Clamping of an angle iron by means of a rectangular piece.

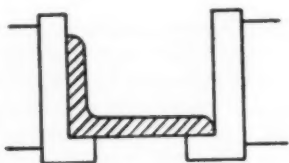


Fig. 6

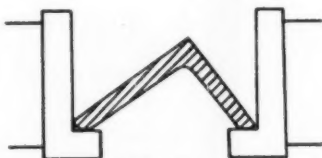


Fig. 7



Fig. 8

6 and 7. Clamping of an angle iron by L-shaped jaws. **8.** Circular segment clamping, an improvement over **4**.

something special is made up.

Let us start with an ordinary parallel machine vise, whether operated by screw, quick clamp screw or eccentric. Basically it has a fixed jaw and a movable jaw, figure 1 and only rectangular workpieces can be clamped, occasionally a vee or several vee's are cut into the jaws, so that also work of cylindrical shape can be clamped, figure 2. If one wants to use the available vise there is the expediency to fit special jaws, which correspond to the profile of the workpiece to be machined, figure 3. Already we observe that the main faces of the body to be clamped must be in a plane perpendicular to the movement of the vise-jaw, which is a serious limitation of the parallel vise.

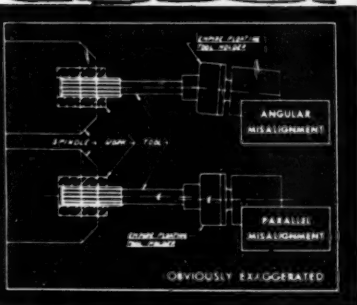
There are a number of tricks to make a parallel vise clamp workpieces of

odd shape. For instance a wedge can be clamped by a circular segment, figure 4. An angle iron by a rectangular piece, figure 5, or by using an L-shape jaw, figure 6, which can be obtained by screwing a ledge to an existing jaw. In this device also the angle-iron can be inserted in an oblique direction without being pushed out by the clamping force, figure 7.

Some manufacturers of commercial vises have fitted turret-type jaws swivelling about a vertical pin. Such a turret has cuts of various shapes: small and large areas of circle, small and larger Vee's and those of different angles, so that a large amount of different workpieces can be clamped safely.

Even Vee's can be cut in other directions to ensure a good holding.

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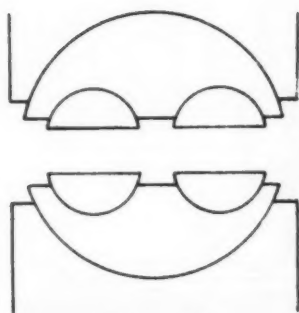


Fig. 9

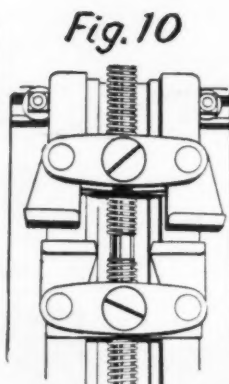


Fig. 10

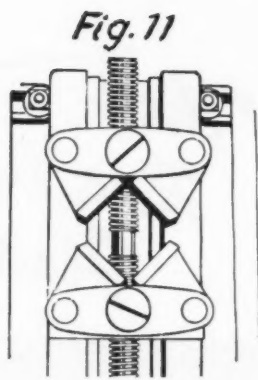


Fig. 11

9. Subdividing the jaws brings an improved solution. 10 and 11. Typical positions of the jaws in the Polyp vise (Elmeso).

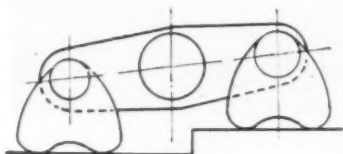


Fig. 12



Fig. 13a

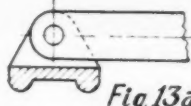


Fig. 13b

12. Further adaptability is obtained by providing each small jaw with two curved faces, improvement over 9, 13 a and b. Improved and stronger boss design, no load on pin; (a) conventional design, (b) improved design.

into each jaw, figure 8, a variety of shapes in particular those whose clamping faces are not parallel can be clamped. But obviously there are limits, as each face must be gripped by a single jaw.

In the Elmeso-vise two circular jaws are divided, thus creating four jaws swinging along two arc-shape guides. A large variety of shapes can be clamped: rectangular, wedge-shaped, square, cylindrical prismatic. Even workpieces with an internal boss, but in this instance the limitations of the device become obvious.

Avoid this limitation by a subdivision of each half of the jaw, figure 9. The clamp has now two main jaws, carrying each a hinged jaw. With such a device practically all types of workpieces can be clamped securely. It is of interest to state that this principle has been successfully applied in the Polyp vise according to Thienes. It has four movable jaws from which two always are fixed to a balancing lever with pivots in the axis of the vise. Practically any workpiece can be clamped with this device. Figures 10 and 11 show some typical positions of the jaws.

Still more adaptability is given by providing the small jaws instead of a flat face with two separate supporting faces, figure 12. A further point of weakness is that the clamping force, which of course is already subdivided to a fraction of the total force has to go through the pivots. This can be avoided by designing in such a way, figure 13, that the pivot does not carry the load, but a face on the lever itself. The hole for the pivot is oversize and this connection only acts when withdrawing.

This short survey may show that there exist a few, quite interesting solutions to the clamping problem of irregular shape workpieces, but that still much could be done to facilitate the work of the man on the machine.

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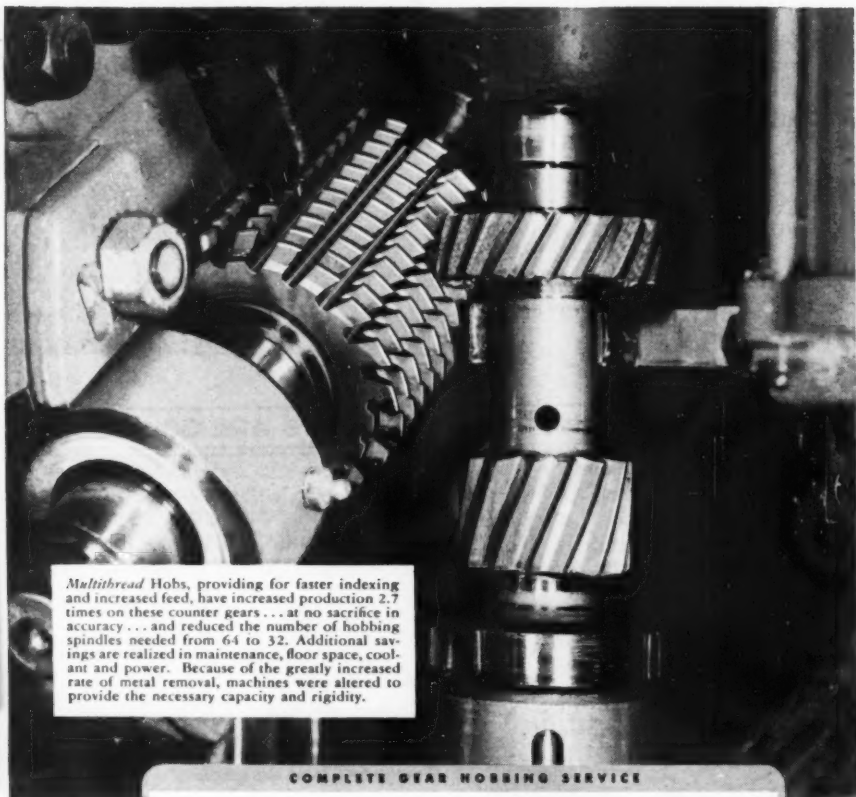


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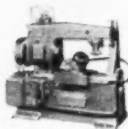
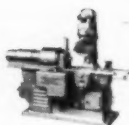
Multithread Hobs

TRIM GEAR CUTTING COSTS

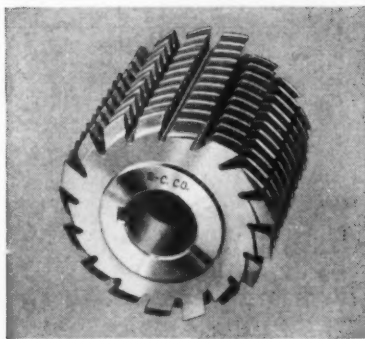


Multithread Hobs, providing for faster indexing and increased feed, have increased production 2.7 times on these counter gears... at no sacrifice in accuracy... and reduced the number of hobbing spindles needed from 64 to 32. Additional savings are realized in maintenance, floor space, coolant and power. Because of the greatly increased rate of metal removal, machines were altered to provide the necessary capacity and rigidity.

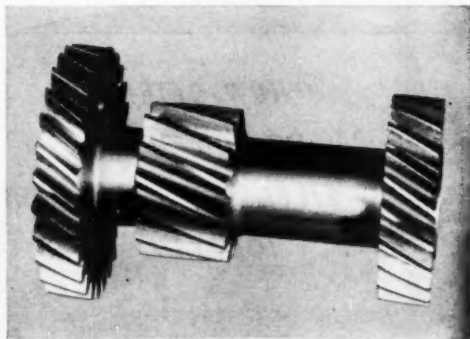
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▲ These 4" x 4" Multithread hobs have more gasches for finer finish. A taper hole eliminates runout, holding the pitch line of the cut gears to maximum concentricity. Precision spacing of 3 leads produces involute and tooth spacing to preshave limits.

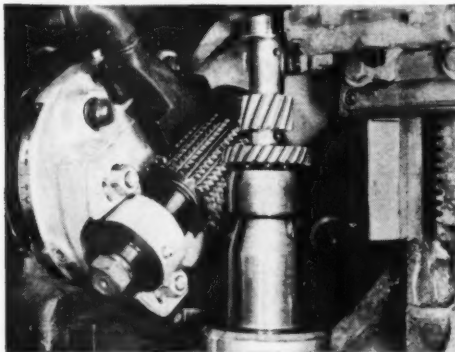


▲ These 27 and 22-tooth 9.25 pitch gears (for passenger car and truck transmissions) are forged from AISI 5145 or 8620-H steel. Multithread hobs have cut costs per gear to slightly over 1/3 former average. Lead errors are held within .0005". Production per hour has been increased from 26 to 82 gears (net, at 85% efficiency).

Automotive Plant Pioneers New Hob Application with Barber-Colman Hob Engineers. Disregards Conventional Hob Design to Almost Triple Production. Cuts Costs to 1/3 Previous Average.

▼ The 27-tooth gear on the counter gear is hobbled at 156 rpm and .062" feed. Previous feed was .053". Face width is 5 8". Cutting time per gear has been reduced from 6.55 to 2.2 minutes. Remarkable savings are possible because of increased feed and faster indexing with Multithreads.

The 22-tooth gear on the counter gear is hobbled at 156 rpm and .052" feed. Cutting time is 2.16 minutes. Single-thread ground hobs formerly cut at .043" feed. Hobbing time averaged 6.13 minutes per gear.



Multithread Hobs are a development by Barber-Colman engineers, providing faster indexing in the hobbing of gears. Instead of the usual single lead, Multithreads have several threads, and have produced unusual production increases on gear cutting jobs requiring very high rates of output.

As a result of production gains possible with hobs of this design, a fewer number of hobbing machines are required to complement the finish shaving and grinding equipment.

Multithreads are recommended only on the basis of comprehensive analysis of the job factors in individual plants. Therefore, we suggest that you ask a Barber-Colman Representative to call.

Write for additional information about the production increases possible with Multithread Hobs.

Barber-Colman Company

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UNITED STATES STEEL

Report number 14

Lathes... part 2

This is the thirteenth in a monthly series of special reports discussing various types of machine tools. Included in this month's special report on lathes:

1. Automatic tracer control takes guesswork out of machining,
2. Descriptions of late model Lathes,
3. Specifications of American-built machines.

Previously published reports discussed: 1. Thread Rolling; 2. Power Press Brakes; 3, 4, 5. Milling machines; 6. Honing, Lapping, and Superfinishing; 7. Automatic Screw machines; 8. MAPI Replacement Formula; 9, 10. Chucking machines, Turret Lathes, Hand Screw machines; 11. Broaching machines; 12. Shapers, Slotters, Keyseaters; 13. Lathes.

Part 1. Adjustable stops add efficiency to engine lathe operations

by Fred M. Burt

The adjustable carriage stops in common usage on turret lathes are rare features in engine lathe operation, but can be of major importance in adding new efficiency and flexibility in certain types of work. In aircraft plants on airframe metal parts machining, it is necessary to make many short, multiple operation runs on lathes,

In the Northrop Aircraft, Inc., plant, Hawthorne, Calif., this production is such, from time to time, that it would cause too much tie-up on turret lathes,

making it more desirable that it be done with engine lathes of which there are a considerable number. To make these engine lathes more exactly suitable for these multiple operation short runs, requiring multiple lathe return settings, an adjustable stop was designed. It eliminates the use of tool fits and adjustable parallels which accommodate the varying materials lengths involved in the turning or boring operations. It is designed so that it can be pre-adjusted to the carriage travel re-



quirements of the tools in the tool post turret of the engine lathe. The different

1. This adjustable stop for engine lathes . . . is used by machinists to save time on jobs requiring multiple lathe return settings. Suggested by the type of stops used on turret lathes, the idea has been applied to nearly all engine lathes.

stop rods in the unit can be set at the proper lengths to coordinate with the tool post turret.

In the 3" dia. x $\frac{7}{8}$ " thick, heat-treated chrome-moly disc that forms the body of the stop, six threaded holes were tapped for the $\frac{7}{16}$ " threaded rods (A & N bolts with heads cut off) carrying shear nuts for locking purposes.

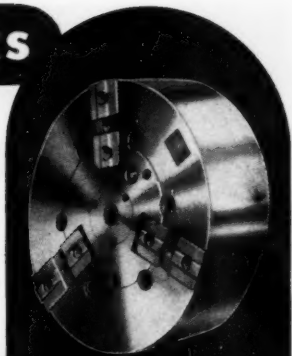
In most engine lathes a hardened button is screwed into the end of the carriage to bump into the micrometer



"Never been bothered by hitch-hikers since . . ."

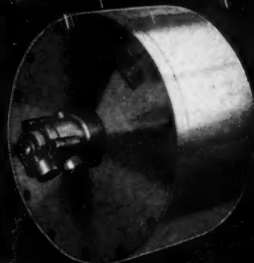
SKINNER POWER CHUCKS

Skinner has a complete line of models for heavy duty production work on engine and turret lathes and automatic machines. Sizes from 6" to 21" with forged steel bodies, and with either 2 or 3 adjustable or non-adjustable jaws are available. The wedge angle is such that work is gripped positively, either internally or externally, regardless of jaw position. The chuck will not release the work, even if air line is broken, until operator actuates draw bar.



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Skinner double acting rotating or non-rotating air cylinders, for operating power chucks and fixtures, use a minimum amount of air. Large air ports give quick piston movement. Bronze piston packing spacer reduces friction and insures piston alignment and support. All packings are adjusted automatically by the pressure of the air against the flanges of the packings. Available for 6" to 21" dia. power chucks.



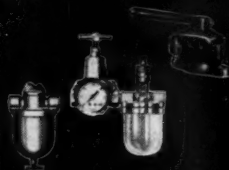
SKINNER ACCESSORIES

Skinner power chucking accessories include: hand operating valve which is self-sealing and easy operating regardless of position — complete air unit including regulating valve, pressure gage and lubricator—filter to remove all impurities, scale, etc. from the air line — soft blank top jaws — draw bars — draw tubes, etc.

Write for catalog giving complete details on the Skinner line of power and manually operated chucks.

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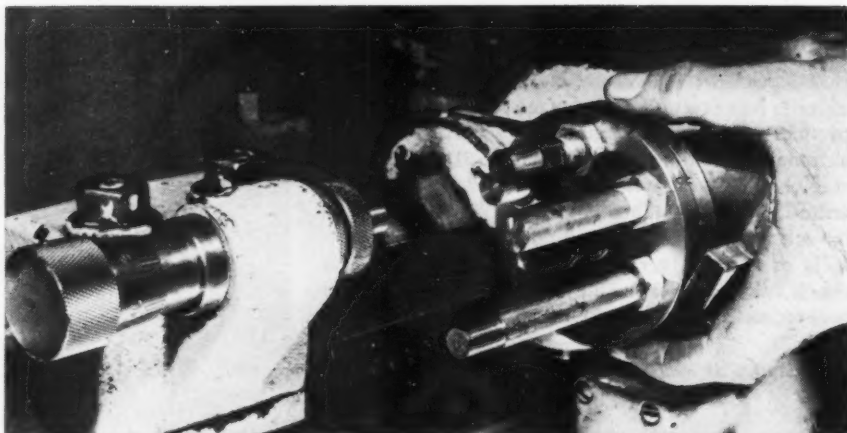
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2. Spring-loaded ball bearing inholder inside operator's index finger . . . travels in groove in center of disc-rests in dimples at each rod location to position another rod used as stop against micrometer stop in zero position.

stop. For attachment of these new stops and their appurtenances, the buttons are removed to be replaced by a special, machined bracket which has been drilled and counterbored to receive an Allen head cap screw flush with the bracket surface. With this screw holding the bracket tight against the carriage, the bracket also fits over the upper lip of the carriage for further support and rigidity.

The stop body is attached to the bracket with a stripper bolt to hold it permanently close to the bracket's smooth surface but with enough (.001")

clearance to allow it to be turned on its stripper bolt axis for indexing the stopper rods. In a lower, outer part of the bracket, projecting at about a right angle from its face, and positioned close up against the periphery of the disc, there is a spring-loaded ball-bearing with screw adjustment. This fits into small dimples, figure 2, in the groove cut in this periphery, to prevent inadvertent turning of the stop, but allowing it to be turned to a new position with ease. More than a dozen of the Northrop lathes have been thus equipped with very satisfactory results.

Part 2. Descriptions of late model Lathes

LeBlond's model RT toolroom lathe

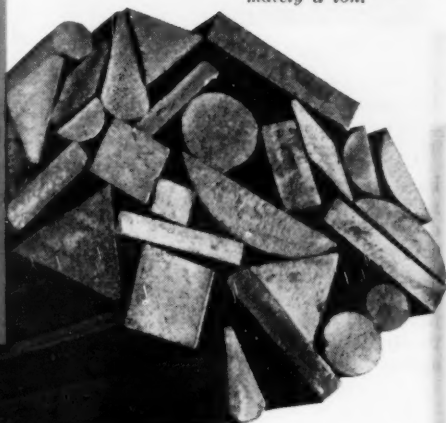
Over 10 speeds may be selected in each of three ranges without stopping

spindle in this 16" toolroom lathe, made by The R. K. LeBlond Machine Tool Co., Cincinnati 8, O. The three-purpose speed adjuster unit, located within easy reach of operator's hands, consists of shifter for shifting to any one of three

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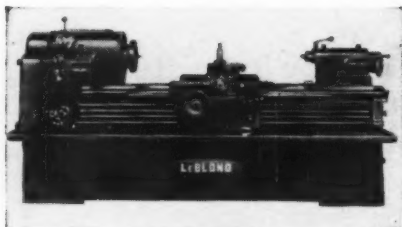
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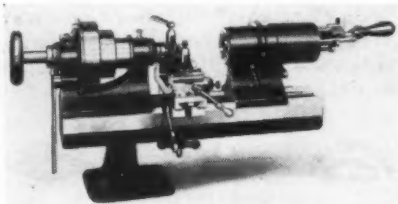
drives, speed selector dial for varying the speed of the main drive motor, and a button for jogging main drive motor.

Other features: combination gear-belt drive headstock which provides spindle speeds in three ranges; totally enclosed universal quick-change box; universal power rapid traverse which moves carriage, cross slide, and tailstock; one-piece apron with positive jaw feed clutch; automatic lubrication throughout headstock, feed box, and apron.

Sloan & Chace precision bench lathe

For many types of light manufacturing, these lathes, made by Sloan & Chace Mfg. Co., Inc., Kearney, N. J., take the place of the more highly equipped regular type tools.

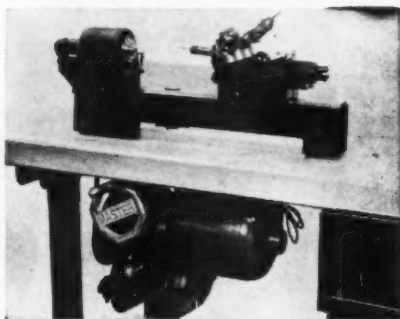
The manufacturing lathe, illustrated,



has a treadle foot operated brake in the large cone pulley. The bed ways and centers are interchangeable and work is readily transferred if required. Special tailstocks and other attachments are supplied to order.

Derbyshire's model No. 750

This production lathe for precision instrument parts manufacturing, is made by F. W. Derbyshire, Inc., Waltham 54, Mass. The units is provided with a 22" bed and enclosed, double



row ball-bearing headstock with spindle speeds up to 12,000 rpm. The foot treadle operated spring-bind collet closer, after having been adjusted to the required tension, is easily opened and closed whether the spindle is rotating or idle, leaving the operator with both hands free to work turret and slide.

Lathe takes Derbyshire standard "Magnus-Elect" wire chucks with a capacity of from .004" to .315".

16" geared head engine lathe

The headstock of this lathe, made by Porter-McLeod Machine Tool Co., Inc., Hatfield, Mass., is a full box section with proper internal ribbing entirely self-contained. The spindle is chrome nickel steel, forged and bored from the solid. It is mounted front and rear on Timken bearings. The compound rest is taper gibbed. No T slits are cut in the swivel, the full surface being given to the bearings. The swivel is graduated up to 90°. The top slide will clear the cross screw dial in any position.

The apron is double-walled and so patterned that all gears run in a bath of oil. Quick change gear box is a unit mechanism, bolted to the bed.

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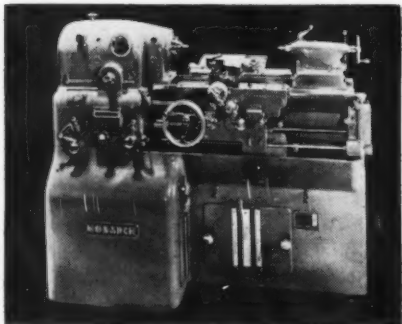
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Monarch 10" sensitive precision model EE

This lathe, made by The Monarch Machine Tool Co., Sidney, O., features an all electric drive through multiple "V" belts. It provides 100 to 1 range of gearless, stepless, spindle speeds . . . forward or reverse. Extremely slow speeds obtained through 6 to 1 speed

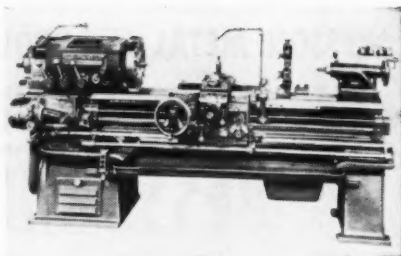


reducer which is integral with main drive motor in cabinet base. This range is also stepless and provides ample power for the taking of heavy cuts at slow speeds. Dynamic brake will stop spindle in two or three seconds, even from highest speeds.

Filtered and metered automatic force feed lubrication is sent to all apron parts, carriage bearing on hardened bed ways and to bottom slide bearings on carriage.

Reed-Prentice model B toolroom

Eight or 16 spindle speeds can be obtained through nine or 13 accurately cut spur gears shaved to a true involute form concentric with pitch line and operated on heat treated multiple spline shafts. Increased or decreased spline speeds can be obtained by changing overhead drive or motor speed. Construction suitable for high spindle speeds and for use with tungsten carbide cutting tools. Lathe is made by Reed-Prentice Corp., Worcester, Mass.

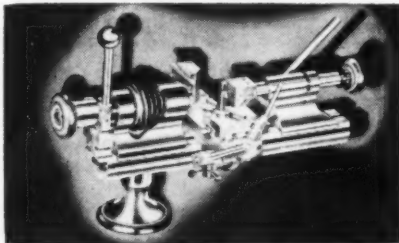


Spindle bearings are Timken precision type; four bearing mounting, thrust adjustment taken on two fronts, rear bearings mounted in float-sleeve to compensate for slight variations in spindle and housing resulting from temperature changes.

Levin small precision lathe

The application of pre-loaded ball bearings to Levin lathe spindles has resulted in a high degree of precision and rigidity. In two types of ball bearing lathes, made by Louis Levin & Son, Los Angeles, Cal., one uses the standard WW type wire chuck with 5 mm (.1968") capacity clear through, the other uses a larger wire chuck, 8 mm (.315").

All castings used are made of Mee-

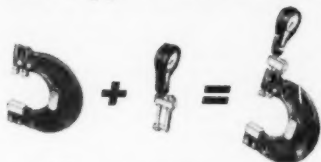


hanite, machined all over and nickel plated. Bed ways are precision ground to fit standard WW type accessories. Both pulley and draw bar hand wheel are made of linen base laminated phenolic.



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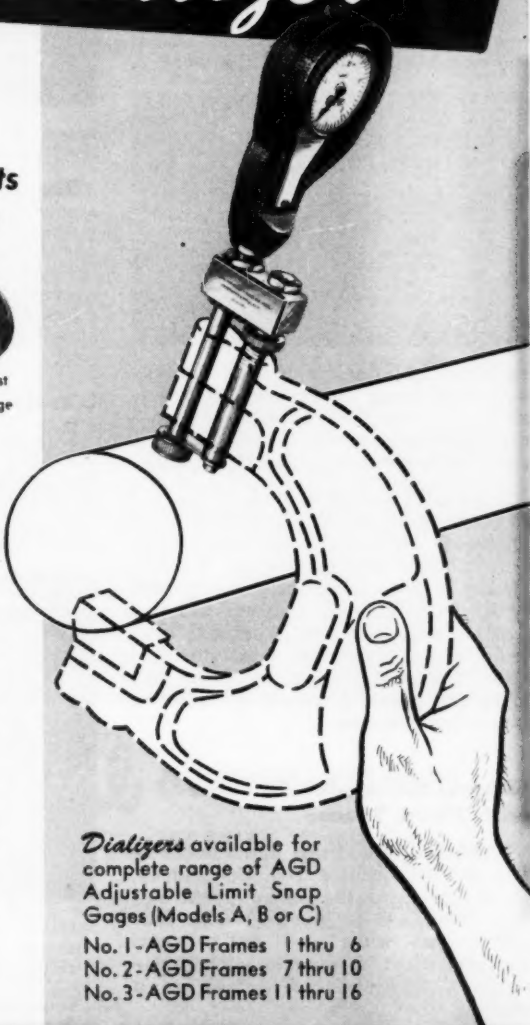
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Dializers available for complete range of AGD Adjustable Limit Snap Gages (Models A, B or C)

No. 1-AGD Frames 1 thru 6

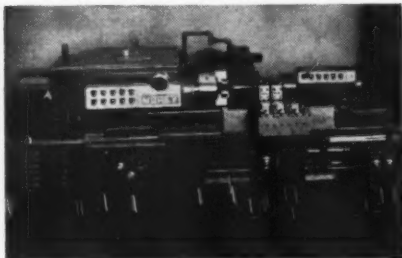
No. 2-AGD Frames 7 thru 10

No. 3-AGD Frames 11 thru 16

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

Morey automatic lathe

This lathe, made by Morey Machinery Co., Inc., New York, N. Y., uses unit-design, which is a method of designing and assembling a machine tool from a number of interchangeable, self contained, standard units. These units can be selected and assembled to fit the exact requirements of the work to



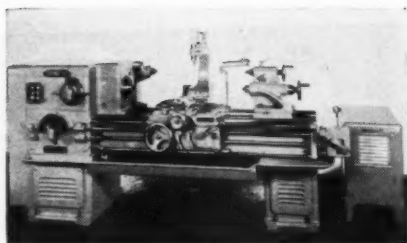
be done and the result is a machine which combines the economy of standard units with the efficiency of a special-purpose machine. Each machine contains a number of standard units.

Typical of standard units is the T-8 toolslide unit which is hydraulically operated, electrically controlled, and adjustable to any position on the machine. It is mounted on a swivel base with graduated dial adjustable to any desired angle. It has individual controls for rapid advance, adjustable feed with stepless variation, automatic tool relief in either direction as selected, plus other features.

Sidney 16" model 32 lathe with Fluid Tracer

The lathe bed of this lathe, made by The Sidney Machine Tool Co., Sidney, O., differs from the conventional design in that it is provided with four longitudinal walls and double cross girts spaced at 12" intervals. This construction resists deflection and twisting.

The all-herringbone geared headstock provides 32 pre-selective spindle

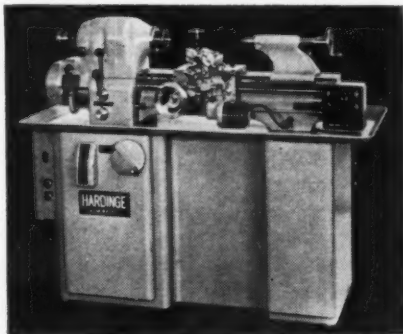


speeds in geometric progression. Forced feed lubrication to all bearings.

The Fluid Tracer is applied to a standard lathe and serves the dual purpose of tracing from a master and performing regular lathe work without limiting the range of either. There are no parts to put on or take off when a change-over is made from tracing to standard operations.

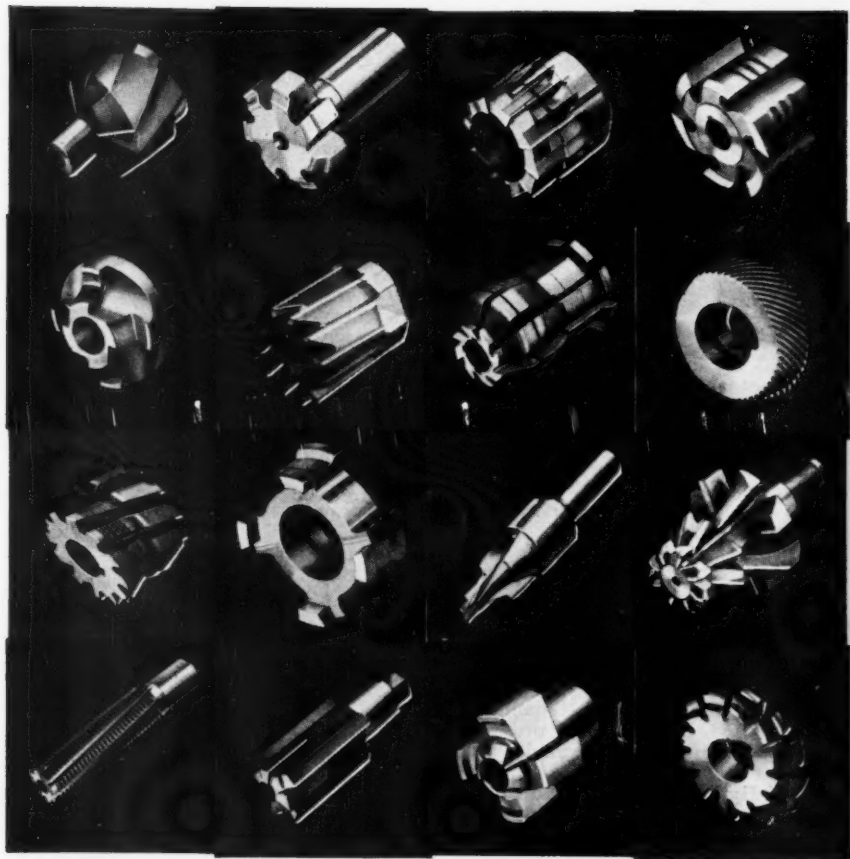
Hardinge model HLV lathe

This lathe, made by Hardinge Bros., Inc., Elmira, N. Y., features a solid full bearing carriage precision fitted directly to the same dovetail bed ways as tailstock and headstock. Lathe has an independent variable electric feed for



carriage and cross slide. Feed can be changed without stopping lathe to shift gears.

Precision gear box and lead screw is for threading only. Standard threads, including pipe threads, are immediately available through the gear box.



Checkmate **RIISING COSTS!**
...WITH SPECIAL
CUTTING TOOLS FROM
NATIONAL TOOL CO.

CLEVELAND 2, OHIO

REPRESENTATIVES IN MAJOR INDUSTRIAL CENTERS

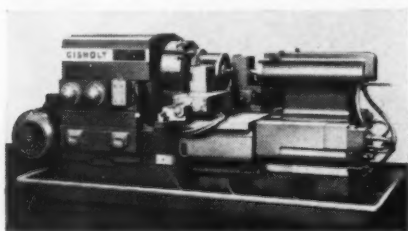


August, 1951

147

Gisholt no. 24 hydraulic automatic lathe

This is a production machine for large parts, made by Gisholt Machine Co., Madison, Wis. The machine is equipped



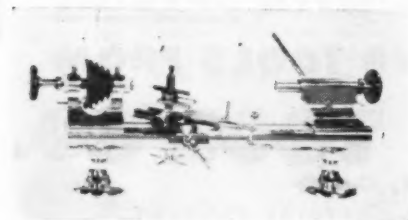
with front and rear independent carriages, each with its own auxiliary slide which can be positioned at any angle to the work. During the automatic cycle the carriages and slides are hydraulically operated. During set-up these hydraulically actuated movements are manually controlled.

Lathe is ideal for tractor's support rollers, diesel cylinder liners and pistons, ball and roller bearing races, aviation and gas turbine parts, pipe flanges, large valve bodies, etc.

Hollow spindle Hydratrol

These lathes, made by Lehmann Machine Co., St. Louis 3, Mo., provide a complete size range with spindle holes ranging from 2½" up to 16" dia. Hollow spindle Hydratrols are fitted to the same bed, carriage and tailstock as the standard Hydratrols. All standard attachments are interchangeable in their corresponding size range.

Speed changes are hydraulically made by a rotary selector valve, giving immediately any one of 16 forward, and eight reverse speeds. Other features include: automatic slide rule indicates

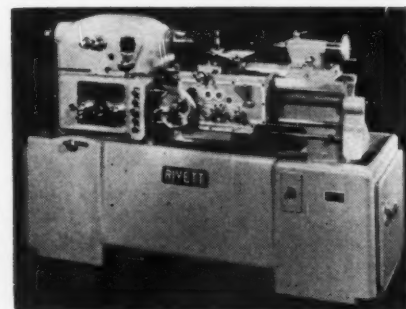


spindle speeds, operation numbers and cutting speed in feet per minute; hydraulic friction clutches and hydraulic brakes; automatic safety relay.

Rivett's 1020 S toolroom lathe

This geared head lathe, made by Rivett Lathe & Grinder, Inc., Brighton, Mass., combines the feather-touch sensitivity of an instrument lathe with the ruggedness which carbide cutting tools require. Its capacity for work is limited only by its centers and its swing.

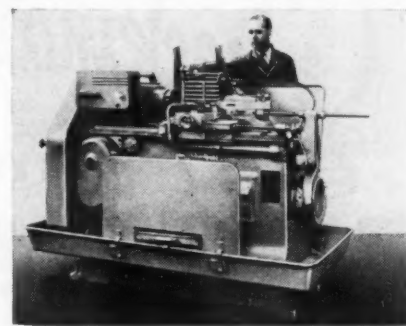
Other features of the 1020 S lathe includes: free spindle by direct belt drive with no gearing engaged; infinite spindle speeds through smooth, V-belt,



mechanical transmission; push button control for speed changing and complete operation; neutral clutch for stopping spindle without stopping drive.

Sundstrand 12A automatic lathe

Adequate hp with automatic cycling and multiple tooling make it possible



MOREY TURRET LATHES

for BAR or CHUCKING

UNIVERSAL
or PLAIN



#3 UNIVERSAL

For bar stock up to 1½" in diameter
16" turning length
18½" swing over bed
Infinite spindle speeds: 55 to 1800 RPM, constant speed
motor: 1200 RPM
AVAILABLE ALSO WITH
PLAIN CROSS SLIDE

#2 PLAIN-GEARED

For bar stock up to 1" in diameter
Turning length 8½"
Swing over cross slide 8"
Swing over bed 14"
Infinite spindle speeds:
Minimum of 60 RPM
Maximum of 2000 RPM
Custom horsepower on all
speeds.

#4 UNIVERSAL

For bar stock up to 2" in diameter
12" turning length
18½" swing over bed
Infinite spindle speeds: 35 to
1800 RPM, constant speed
motor: 1200 RPM
AVAILABLE ALSO WITH
PLAIN CROSS SLIDE

EARLY
DELIVERY

INFINITE SPINDLE SPEEDS
—Electrically Selected—

DIRECT BELT DRIVE AVAILABLE AT HIGH SPEEDS
ELIMINATES GEAR MARKS
(patents applied for)

GEARED SPINDLE SPEEDS
INSTANTLY AVAILABLE
THROUGH MULTIPLE DISC
CLUTCHES.

SPINDLE MOUNTED ON
TIMKEN BEARINGS.

RIGID—WITH SUFFICIENT
POWER TO TURN AT THE
HIGHEST SPEEDS AND
FEEDS MODERN TOOLS
WILL WITHSTAND.

SPINDLE SPEEDS AND
POWER FEED CHANGES
WITHIN EASY REACH OF
OPERATOR.

BED MOUNTED ON CAST-
IRON BASE.

MOTORS AND STARTING
EQUIPMENT EASILY AC-
CESSIBLE.

HEXAGON TURRET AUTO-
MATICALLY UNCLAMPED,
INDEXED AND CLAMPED.

THREE TYPES OF CROSS
SLIDES AVAILABLE:

Lever Feed
Screw Feed
Combination Feed*

*Combination feed provides
instantaneous selection to
either lever or screw feed.

EIGHT (8) FEED CHANGES
FOR THE UNIVERSAL CAR-
riage and HEXAGON TURRET,
INSTANTLY ENGAGED OR
DISENGAGED BY ONE
MOVEMENT OF THE LEVER.

THE DESIGN OF
THE MOREY No.
2, 3 and 4 TURRET
LATHES ARE
BASICALLY ALIKE. EACH
MACHINE IS ENGI-
NEERED FOR THE SIZE
WORK IT IS DESIGNED
TO HANDLE.

DESIGNED AND BUILT BY
MOREY MACHINERY CO., INC

410 BROOME STREET NEW YORK, N. Y. Phone: 4-52 26-4 RVL ASTORIA NEW YORK

to shorten cutting stroke and cutting time for long runs when using the 12A, made by Sundstrand Machine Tool Co., Rockford, Ill. Quick cycle changeover reduces machine set-up time so that the same production advantages can be obtained for short runs. Complete control of all cycles is provided by adjustment of dogs on a disc, thus the making

of cams is eliminated. Changing of position of dogs on disc changes length of rapid approach, feed and rapid return stroke; further, it enables operator to set up cycle quickly and change over from one job to another.

Wide speed and feed range for handling all types of cutting materials and work pieces is provided.

Part 3 Specifications of American-built machines

Morey Machinery Co., Inc.		New York, N. Y.
Type Size & Model	Swing B=Over Bed C=Over Carriage	Horse Power F=Feeds S=Speeds
Automatic Lathes Model C	B=28"; C=18"	F=1" to 25"; S=60 to 1200 rpm; 25 and 75 hp
Model D	B=23"; C=15"	do

The R. K. LeBlond Machine Tool Company			Cincinnati, Ohio	
Type Size & Model	Swing B=Over Bed R=Over Compound Rest	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Regal Lathes				
13" with leadscrew and feed rod	B=13½"; R=8¼"	18" (in increments of 12")	F=48; .0025"-143"; S=8; 25 to 500 rpm- std.; 37.5-750 rpm- high; ¼ hp-std.; 1 hp-elec. brake	do
15" do	B=15¼"; R=10"	do	do 1 hp-std.; 1½ hp- elec. brake	do
17" do	B=17¼"; R=10½"	30" (in increments of 12")	F=56; .001"-125"; S=8; 20 to 425 rpm- std.; 30 to 638 rpm- high; 1½ hp-std.; 2 hp-elec. brake	N=56 R=1½ to 184
17"/28" Sliding Bed Gap	B=17¼"; R=10½"; G=30"	38" (bed closed) 58" (bed extended)	F=56; .001"-125"; S=8, 16, and variable; 20 to 425, 10 to 425, and 12 to (90 rpm; ½, 1½, 2 or 3 hp	do
Regal Plain Bed Gap Lathes are available in 4 sizes: 17", 19", 21" and 24"				
19" with leadscrew and feed rod	B=19¼"; R=12"	30" (in increments of 12")	F=56; .001"-125"; S=8; 20 to 425 rpm- std.; 30 to 638 rpm- high; 2 hp-std.; 3 hp-elec. brake	do
21" do	B=22¼"; R=13½"	36" (in increments of 12")	F=63; .0027"-333"; S=8; 15 to 350 rpm- std.; 24 to 525 rpm- high; 5 hp	N=63 R=1 to 120
24" do	B=25¼"; R=17"	do	do	do



Bay State internal wheels have been "inducted" for a host of Defense Jobs . . .

Aircraft Cylinder Sleeves
Anti-Friction Bearings of All Kinds
Gun Barrels
Propellor Hub Cones
Connecting Rods
Aircraft Crankcase Assemblies
Cartridge Dies
Tank Turret Housings and Shields, etc. etc.



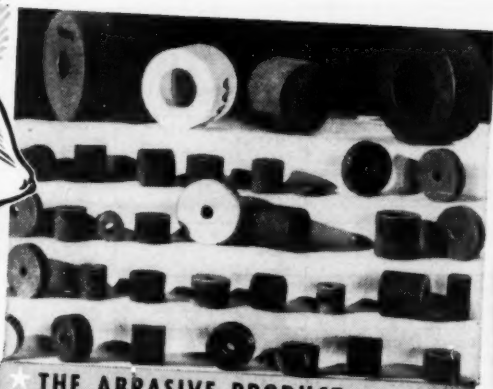
Ask for Bay State engineered-help on your next job.

**BAY
STATE**

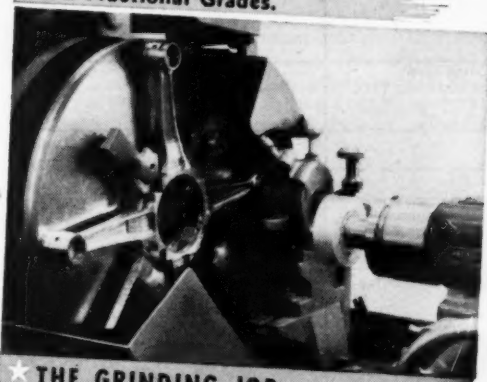
BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal Cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario

★ KEEP AMERICA STRONG ★



★ **THE ABRASIVE PRODUCT**
Bay State Internal Wheels . . .
Quality Control Manufactured
in Fractional Grades.



★ **THE GRINDING JOB**
Internal Grinding Crank Holes
in Four Aircraft Conn Rods
Simultaneously.

The R. K. LeBlond Machine Tool Company

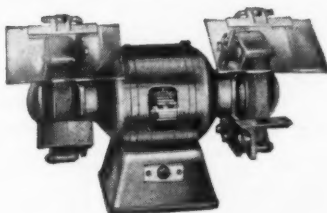
Cincinnati, Ohio

Type Size & Model	Swing B=Over Bed R=Over Compound Rest	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading that can be cut R=Range of threads N=No. of threads
32" do	B=34½"; R=23½"; G=52½"		F=60; S=16 or 32; 2 to 500 rpm; 30 or 40 hp	N=60
16"/38" Heavy Duty Sliding Bed	B=20½"; R=13½"; G=40½"	6" to 10"	F=48; .0028"-.333"; S=12; 9 to 700 rpm; 10 hp	N=48 R=1 to 120
25"/50" do	B=30½"; R=19½"; G=56"	8" to 13"	F=48; .004"-.250"; S=16; 3.25 to 400 rpm; 12½ or 25 hp	N=48 R=¼ to 46
32"/60"	B=34½"; R=23½"; G=61½"	7" to 12"	F=48; .004"-.250"; S=16; 3 to 315 rpm; 15 or 30 hp	do
Rapid Production Lathes				
13" Regular Anti- Friction Headstock	B=14½"; R=8½"	12½"	F=9; .006"-.064"; S=68 to 400 rpm-std.; 102 to 600 rpm-high; 3 or 5 hp	
13" High-Speed Anti- Friction Headstock	do	12"	F=9; .002"-.020"; S=200 to 1200 rpm-std.; 250 to 1500 rpm-high; 3 or 5 hp	
13" High-Speed Motor Headstock (AC)	do	18"	F=9; .001"-.010" or .002"-.020"; S=6; 450 to 3600 rpm; hp built in head	
17"	B=17¼"; R=10½"	16"	F=18; .004"-.115"; S=54 to 375 rpm-std.; 81 to 565 rpm-high; 5 to 7½ hp	
20"	B=20¼"; R=12½"	25¼"	F=18; .005"-.150"; S=45 to 300 rpm-std.; 67 to 450 rpm-high; 10 hp	
Engine Lathe				
16" Model RT Heavy Duty	B=18½"; R=11½"	30" (in incre- ments of 24")	F=60; .004-.258"-gear drive; .0014"-.090"- belt drive; S=16; 30 to 531 rpm- gear drive; 730 to 1537 rpm-belt drive; 10 or 15 hp	N=60 R=2 to 120
Tool Room Lathe				
16" Model RT	do	do	F=60 (30-coarse); .0007"-.042"-belt drive; .0044"-.258"-gear do; .276"-.2.064"-coarse feeds; S=over 300; 6 to 60 rpm-low back gear; 30 to 300 rpm-high back gear; 150 to 1500 rpm-direct belt drive; 7½ hp	N=60 (30-coarse) R=2 to 120 (¼-1½ coarse)
Dual Drive Lathes				
	B=15"; R=9½"	30"	F=48; .0017"-.1062"- gear drive; .0004"- .026"-direct belt drive; S=12; 28 to 445 rpm- gear drive; 540 to 1800 rpm-belt drive; 3 hp	N=48 R=4 to 224

For small tools or light production work, read here about the 1/3 h.p.

Baldor

UTILITY GRINDER 6110



This Baldor Utility Grinder No. 6110 is powered by a $\frac{1}{3}$ h.p. capacitor-start, capacitor-run motor that has no commutator, no brushes, no centrifugal switch—a really trouble-free motor that will not burn out, even when repeatedly overloaded.

Complete as shown

\$57.00

The Special Reversible Carbide Tool Grinder shown at the right is a heavy-duty $\frac{1}{2}$ h.p. 3400 RPM grinder for sharpening carbide tools and high speed steel tools. This motor also is the trouble-free, capacitor-start, capacitor-run type.

Complete as shown **\$142.60**



OUTSTANDING FEATURES:

The near perfect balance of armatures and wheels on Baldor Grinders provides smooth, vibrationless performance, permitting precision grinding to closest tolerances.

Motors have ample power for normal use plus reserve power to withstand temporary overloads and are built to give years of heavy-duty service.

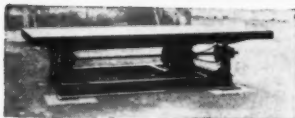
Phone your industrial distributor now or clip this ad to your letterhead and mail for bulletins 345 and 341.

BALDOR ELECTRIC CO.
4368 Duncan Ave., St. Louis 10, Mo.

The R. K. LeBlond Machine Tool Company

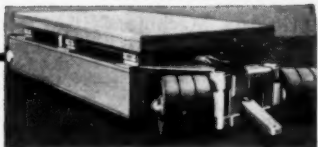
Cincinnati, Ohio

Type Size & Model	Swing B=Over Bed R=Over Compound Rest	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Engine Lathes				
12" Heavy Duty with 24-spd. headstock	B=14½"; R=8¼"	30" (in incre- ments of 24")	F=60; .002"-.126"; S=12 or 24; 25 to 1250 rpm; 7½ hp	N=60 R=2 to 120
14" do	B=16½"; R=9¾"	do	do	do
16" do	B=20½"; R=13½"	do	F=60; .0027"-.152"; S=12 or 24; 16 to 1010 rpm; 10 or 15 hp	N=60 R=1 to 60
20" Medium Duty Engine & Tool Room	B=22½"; R=16"	54" (in incre- ments of 24")	do	do
20" Heavy Duty with 32-spd. headstock	B=22½"; R=14½"	48" (in incre- ments of 24")	F=60; .004"-.250"; S=16 or 32; 9 to 800 rpm; 15 or 20 hp	do
25" Heavy Duty	B=30½"; R=19½"	do	F=48; .004"-.250"; S=16 or 32; 5 to 602 rpm; 25 to 40 hp	N=48 R=¼ to 46
32" do	B=34½"; R=23½"	60" (in incre- ments of 24")	F=48; .004"-.250"; S=16 or 32; 4 to 500 rpm; 25 to 40 hp	do
40" do	B=44½"; R=28½"	60"	F=54; .005"-.308"; S=27; 1.5 to 165 rpm; 40 hp	N=54 R=½ to 30
50" do	B=52½"; R=35½"	do	do 50 hp	do
Tool Room Lathes				
12"	B=14½"; R=8¼"	30" (in incre- ments of 24")	F=60; .002"-.126"; S=12 or 24; 25 to 1250 rpm; 7½ hp	N=60 R=2 to 120
14"	B=16½"; R=9¾"	do	do	do
16"	B=20½"; R=13½"	do	F=60; .0027"-.152"; S=12 or 24; 16 to 1010 rpm; 10 to 15 hp	N=60 R=1 to 60
20"	B=22½"; R=14½"	48" (in incre- ments of 24")	F=60; .004"-.250"; S=16 or 32; 9 to 800 rpm; 15 or 20 hp	do
Hollow Spindle Lathes				
16"	B=20½"; R=13½"	30" (in incre- ments of 24")	F=60; .0025"-.152"; S=12; 15 to 415 rpm; 10 hp	do
20"	B=27"; R=18¾"	48" (in incre- ments of 24")	F=60; .004"-.250"; S=18; 10 to 362 rpm; 15 or 20 hp	do
Gap Lathes				
12" Plain Bed	B=14½"; R=8¼"; G=25¼"		F=60; S=12 or 24; 12½ to 1250 rpm; 7½ hp	N=60
14" do	B=16½"; R=9¾"; G=26¾"		do 7¼ hp	
16" do	B=20½"; R=13½"; G=31¼"		F=60; S=12 or 24; 8 to 1010 rpm; 15 hp	N=60
20" do	B=22½"; R=14½"; G=36"	*	F=60; S=16 or 32; 4.5 to 800 rpm; 15 or 20 hp	N=60
25" do	B=30½"; R=19½"; G=45¼"		F=60; S=16 or 32; 2.5 to 600 rpm; 25 or 30 hp	N=60

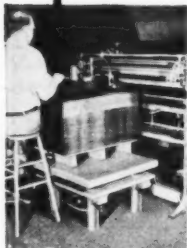


Portelvator; fixed position; pit installation for positioning truck and trailer beds to loading platform.

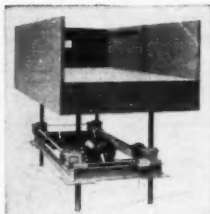
Portelvator; portable, elevating, tilt top; to facilitate removal and emplacement of bus motors.



Portelvator; portable, elevating; for the movement and positioning of automobile body dies.



Portelvator; fixed position, automatic, self-leveling; for sheet feeding operation.



Portelvator; fixed position; pit installation for "below and above floor level" operation; sheet feeding.



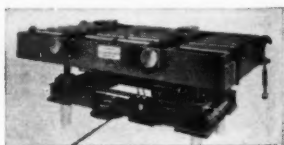
Portelvator; standard style "A"; capacity, 2000 pounds; lift, 15".



Portelvator; fixed position; basement installation for extra high lift from ground floor.



Portelvator; standard style "S"; capacity, 1000 pounds; lift, 52".



Portelvator; fixed position, roller top, elevating, die transfer table; self-loading and self-discharging; capacity, 25 tons.

Focus
on the

MOVEMENT and POSITIONING of

TOOLS and MATERIALS



The devices shown here are typical of standard and special PORTELVATORS® regularly used by industry to effect the smooth movement and accurate positioning of tools and materials. The record of production economies brought about by the use of such devices is astounding.

Doubtless the application of a similar device will improve your production also. We will be happy to furnish you with details of construction and operation. Ask also for our Bulletin P-502 which gives full particulars about standard Portelvators.



THE
Hamilton
TOOL COMPANY

826 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

Lehmann Machine Co.
St. Louis, Missouri

Type Size & Model	Swing B=Over Bed S=Over Cross Slide	Distance between Centers	Horse Power F=No. of and range of feeds per rev. S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Engine Lathes				
16" Std. Hydratrol	B=18½"; S=11½"	30"	F=56; .0035" to .4"; S=16; 10 to 670 rpm; 5 to 15 hp	N=56 R=2 to 224
18"	B=20½"; S=14"	30"	F=56; .0035" to .4"; S=16; 10 to 670 rpm; 5 to 15 hp	N=56 R=2 to 224
20"	B=24½"; S=15"	48"	F=63; .0055" to .64"; S=16; 8 to 525 rpm; 10 to 20 hp	N=63 R=⅜ to 72
25"	B=27½"; S=18¼"	48"	F=63; .0055" to .64"; S=16; 8 to 525 rpm; 10 to 20 hp	N=63 R=⅜ to 72
32"	B=34½"; S=22½"	60"	F=63; .0055" to .64"; S=16; 6 to 410 rpm; 20 to 40 hp	N=63 R=⅜ to 72
36"	B=37½"; S=26"	60"	F=63; .0055" to .64"; S=16; 6 to 410 rpm; 20 to 40 hp	N=63 R=⅜ to 72
16" Medium Duty Hydratrol	B=18½"; S=11½"	30"	F=56; .0035" to .4"; S=16; 10 to 670 rpm; 5 to 15 hp	N=56 R=2 to 224
18"	B=20½"; S=14"	30"	F=56; .0035" to .4"; S=16; 10 to 670 rpm; 5 to 15 hp	N=56 R=2 to 224
16" Std. Grd. Hd. Medium Duty Hydratrol	B=18½"; S=11½"	30"	F=56; .0035" to .4"; S=16; 10.5 to 422 rpm; 5 to 7½ hp	N=56 R=2 to 224
18"	B=20½"; S=14"	30"	F=56; .0035" to .4"; S=16; 10 to 400 rpm; 5 to 7½ hp	N=56 R=2 to 224
20"	B=22½"; S=14½"	30"	F=56; .0035" to .4"; S=16; 9.5 to 385 rpm; 5 to 7½ hp	N=56 R=2 to 224
22" Std. Grd. Hd. Heavy Duty Hydratrol	B=24½"; S=15"	48"	F=64; .0055" to .64"; S=16; 8 to 525 rpm; 10 to 20 hp	N=64 R=⅜ to 72
25"	B=27½"; S=18¼"	48"	F=64; .0055" to .64"; S=16; 8 to 525 rpm; 10 to 20 hp	N=64 R=⅜ to 72
18" Medium Hole Hollow Spdl. Hydratrol	B=20½"; S=13¼"	25"	F=56; .0035" to .4"; S=12; 10 to 300 rpm; 5 to 10 hp	N=56 R=2 to 224
18" Large Hole	do	do	do	do
20" Medium Hole	B=22½"; S=14½"	do	F=63; .0055" to .64"; S=12; 10 to 300 rpm; 5 to 10 hp	N=63 R=⅜ to 72
20" Large Hole	do	do	do	do
25" Large Hole	B=27½"; S=18¼"	48"	F=63; .0055" to .64"; S=12; 5 to 193 rpm; 10 to 15 hp	do
32" Large Hole	B=34½"; S=22½"	60"	F=63; .0055" to .64"; S=12; 5 to 150 rpm; 15 to 30 hp	do
36" Large Hole	B=37½"; S=26½"	do	do	do
18" Medium Duty Model ACS	B=20½"; S=13¼"	25"	F=56; .0035" to .4"; S=12; 10 to 300 rpm; 5-7½ hp	N=56 R=2 to 224
20" Medium Duty Model ACS	B=22½"; S=14½"	do	F=56; .0055" to .64"; S=12; 10 to 300 rpm; 5-7½ hp	N=56 R=2 to 224

This New Procunier "High Speed" Tapping Head is...

RUGGED yet GENTLE to valuable Taps!

Operating under conditions that would "break-down" ordinary tapping heads, this new Procunier Tapping Head has consistently proven itself superior in every way! Designed by a practical engineer for more accurate, high speed production tapping it has been amazing the tapping experts by providing better service, longer life, faster, more dependable tapping with cleaner, sharper threads and fewer broken taps. For over 30 years Procunier Tapping Heads have been establishing new standards of accuracy efficiency and operating economy. They have been acclaimed by the leaders in industry as the "finest money can buy." Here are just a few of the many "reasons why":

1. Tap breakage is practically eliminated due to the high sensitivity of the new Procunier cork-faced friction clutch which automatically regulates driving pressure. Thus, even "green" operators can quickly detect dull or loaded taps by the "feel" or pressure on the clutch.
2. Strain and wear are minimized and torsion eliminated thru special gear reversing mechanism which distributes pull thru three intermediate gears.
3. Chuck spindle is supported at both ends assuring true operation — avoiding tap wobble.
4. Aluminum housings assure greater strength and rigidity with minimum weight — a vital factor for high speed tapping. PLUS many other exclusive features.

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for more complete details and specifications on the complete line of Procunier Tapping Heads and see why Procunier offers the "finest in tapping equipment."

Procunier
Safety Chuck Company

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The exclusive Procunier "Tru-Grip" tap holder is lighter, smaller in diameter. It affords easier

tapping close to walls or shoulders, eliminates "chewed" tap shanks. Holds tap true.

PROCUNIER SAFETY CHUCK CO.

14 S. Clinton St., Chicago 6, Ill.

Dept. 8

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Please send your illustrated brochure giving complete details, specifications and prices on the improved line of Procunier High Speed Tapping Heads

Name

Address

City

Zone... State...

The Monarch Machine Tool Company

Sidney, Ohio

Type Size & Model	Swing B=Over Bed S=Over Cross Slide C=Over Compound	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of thread that can be cut R=Range of thread
Toolmakers' Lathes				
10" Sensitive Precision Model EE	B=12½"; S=7¼"	20"	F=50; .0005" to .016" S=25 to 2500 rpm-open belt; 4 to 400 rpm- speed reducer; 3 hp	N=60 R= 3 to 184
13" Series 60	B=15½"; S=9¼"	30", 54", 78", 102", 126" (longer lengths available on application)	F=66; .0017" to .103"; S=19 to 800 rpm; 5-7½ hp	N=66 R= 2 to 120
Can furnish 1 to 60 range of threads in which case the feed range is .0034"-.206"				
13" Series 60 with plus-swing, No. 1	B=17½"; C=11½"	do	F=66; .0017" to .103"; S=19 to 800 rpm; 5-7½ hp	N=66 R= 2 to 120
do No. 2	B=19½"; C=13½"	do	do	do
16" Series 60	B=18½"; S=10½"	do	F=66; .0014" to .084"; S=17 to 700 rpm; 7½-15 hp	do
Can furnish 1 to 60 range of threads in which case the feed range is .0028"-.168"				
16" Series 60 with plus-swing, No. 1	B=20¼"; C=12½"	do	F=66; .0014" to .084"; S=17 to 700 rpm; 7½-15 hp	N=66 R= 2 to 120
do No. 2	B=22¼"; C=14½"	do	do	do
do No. 3	B=24"; C=16½"	do	do	do
20" Series 60	B=22½"; S=13¼"	48", 72", 96", 120", 144" (longer lengths available on application)	do	do
Can furnish 1 to 60 range of threads in which case the feed range is .0028"-.168"				
20" Series 60 with plus-swing, No. 1	B=24"; C=16"	do	F=66; .0014" to .084"; S=17 to 700 rpm; 10-20 hp	N=66 R= 2 to 120
do No. 2	B=26"; C=18"	do	do	do
13" Super Model 70	B=16; S=9"	30" and 54"	F=66; .001" to .066"; S=12 to 952 rpm; 10-20 hp	do or 1 to 160
Engine Lathes				
13" Series 60	B=15½"; S=9¼"	30", 54", 78", 102", 126" (longer lengths available on application)	F=66; .0017"-.103"; S=19 to 800 rpm; 5-7½ hp	N=66 R= 2 to 120
Can furnish 1 to 60 range of threads in which case the feed range is .0034"-.206"				
13" Series 60 with plus-swing, No. 1	B=17½"; C=11½"	do	F=66; .0017"-.103"; S=19 to 800 rpm; 5-7½ hp	N=66 R= 2 to 120
do No. 2	B=19½"; C=13½"	do	do	do
16" Series 60	B=18½"; S=10½"	do	F=66; .0014"-.084"; S=17 to 700 rpm; 7½-15 hp	do
Can furnish 1 to 60 range of threads in which case the feed range is .0028"-.168"				
16" Series 60 with plus-swing, No. 1	B=20¼"; C=12½"	do	F=66; .0014"-.084"; S=17 to 700 rpm; 7½-15 hp	N=66 R= 2 to 120
do No. 2	B=22¼"; C=14½"	do	do	do

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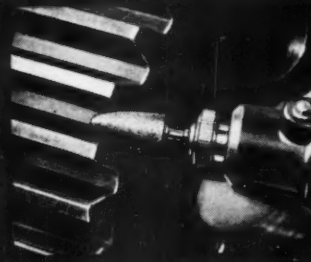
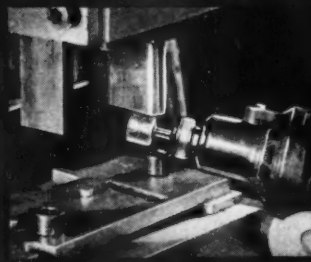
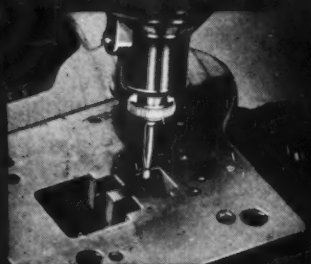
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The Monarch Machine Tool Company
Sidney, Ohio

Type Size & Model	Swing B=Over Bed S=Over Cross Slide C=Over Compound	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of thread that can be cut R=Range of thread
do No. 3	B=24"; C=16½"	do	do	do
20" Series 60	B=22½"; S=13¾"	48", 72", 96", 120", 144" (longer lengths available on application)	10-20 hp	do
20" Series 60 with plus-swing, No. 1	B=24"; C=16"	do	Can furnish 1 to 60 range of threads in which case the feed range is .0028"-.168"	
do No. 2	B=26"; C=18"	do	F=66; .0014"-.084"; S=17 to 700 rpm; 10-20 hp	N=66 R= 2 to 120
20" Model M	B=22½"; S=13"	48" to 288" (in increments of 24")	do	do
25" Model N	B=27½"; S=14"	do	F=48; .0038"-.240"; S=11 to 500 rpm; 15-30 hp	N=48 R=¼ to 46
32" Model NN	B=34½"; S=18"	60" to 324" (in increments of 24")	F=48; .0038"-.240"; S=8 to 405 rpm; 20-40 hp	do
32" Model NN with face plate drive headstock	B=40½"; S=27½"	do	F=48; .006"-.363"; S=8 to 405 rpm; 20-40 hp	N=48 R=½ to 28
Heavy Duty Lathes				
20" Model M	B=27½"; C=18"		F=48; .0038"-.240"	N=48 R=¼ to 46
20" do	B=30½"; C=21"		do	do
25" Model N	B=30½"; C=18"		do	do
25" do	B=33½"; C=21"		do	do
25" do	B=36½"; C=24"		do	do
32" Model NN	B=40½"; C=27½"		F=48; .006"-.363	N=48 R=½ to 28
32" do	B=44"; C=31½"		do	do
32" do	B=48"; C=36½"		do	do
Precision Manu- facturing Lathes				
10" (also available with turret)	B=13"; S=7¼"	20"	F=.002"-.012"; S=25 to 2500 rpm-open belt; 4 to 400 rpm- back gear; 3 hp	
Production Turning Lathes				
Model 15 Mona-Matic	B=15; 8" (over front slide); 7½" (over rear slide)	18", 30"	F=3½"-20 per min. (infinitely variable feed range); S=8; 87 to 3000 rpm; up to 20 hp	
Model 20 do	do	do	F=3½"-20 per min. (infinitely variable feed range); S=8; 155 to 2700 rpm; up to 20 hp	
Roll Turning Lathe				
Heavy Duty Roll-Turner	25" (max. roll diameter body)	102", 126"	F=.046"-3.000" per min.; S=24; 2½ to 505 rpm; 30 hp	R=2½" dia. 4 threds. per in.

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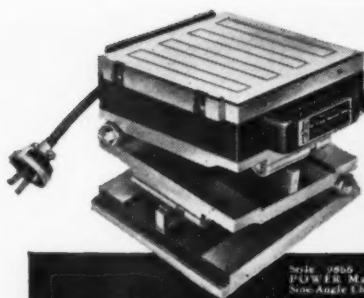
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OF ALL METAL CUTTING JOBS

The Sidney Machine Tool Company

Sidney, Ohio

Type Size & Model	Swing B=Over Bed R=Over Compound Rest G=Over Gap	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Tool Room Lathes				
14" Model 32	B=16½"; R=9¾"	6' bed 30"	F=60; .0028" to .174"; S=32; 13 to 1500 rpm; 5 to 15 hp	N=60 R=1½ to 92
16" do	B=18½"; R=12"	do	do	do
20" do	B=22½"; R=15"	8' bed 48"	do	do
14"	B=16½"; R=9¾"	6' bed 30"	F=60; .0027" to .172"; S=16; 14 to 1000 rpm; 5 to 7½ hp	do
16"	B=18½"; R=12"	do	do	do
20" Model 16	B=22½"; R=14¾"	8' bed 48"	F=60; .0027" to .172"; S=16; 14 to 720 rpm; 7½ to 20 hp	do
Engine Lathes				
14" Model 32	B=16½"; R=9¾"	6' bed 30"	F=60; .0028" to .174"; S=32; 13 to 1500 rpm; 5 to 15 hp	do
16" do	B=18½"; R=12"	do	do	do
20" do	B=22½"; R=15"	8' bed 48"	do	do
14" Herringbone Grd. Lathes with Int. Gear Tooth Clutches	B=16½"; R=9¾"	6' bed 30"	F=60; .0027" to .172"; S=16; 14 to 1000 rpm; 5 to 15 hp	do
16" do	B=18½"; R=12"	do	do	do
18" do	B=20½"; R=12¾"	8' bed 48"	F=60; .0027" to .172"; S=16; 12 to 720 rpm; 7½ to 20 hp	do
20" do	B=22½"; R=14¾"	do	do	do
25" Model 16 Heavy Duty	B=27½"; R=17½"	10' bed 48"	F=48; .003" to .207"; S=16; 5 to 550 rpm; 15 to 40 hp	N=48 R=¼ to 46
32" do	B=34½"; R=19"	12' bed 60"	F=48; .003" to .207"; S=16; 5 to 428 rpm; 20 to 50 hp	do
14"	B=16½"; R=9¾"	6' bed 30"	F=48; .0027" to .172"; S=12; 14 to 950 rpm; 5 to 7½ hp	N=48 R=1½ to 92
16"	B=18½"; R=12"	do	do	do
18"	B=20½"; R=12¾"	8' bed 48"	F=48; .0027" to .172"; S=12; 12 to 730 rpm; 7½ to 15 hp	do
20"	B=22½"; R=14¾"	do	do	do
25"	B=27½"; R=17½"	10' bed 48"	F=48; .003" to .207"; S=12; 8 to 555 rpm; 15 to 25 hp	N=48 R=¼ to 46
32"	B=33½"; R=24"	do	do	do



Model 2005 SUPER-
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Model 510 Swivel Base SUPERPOWER
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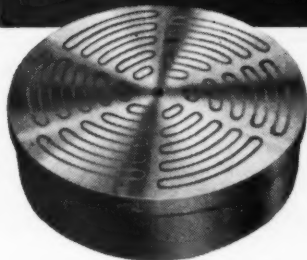
The Taft-Peirce Mfg. Co.

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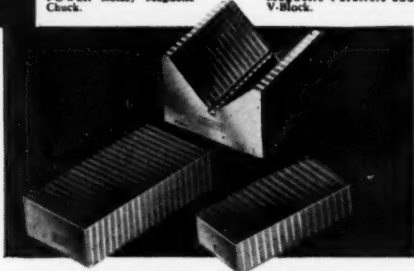


Left: Model 610 SUPERPOWER
Magnetic Chuck



Bottom Left: 16' SUPER-
POWER Rotary Magnetic
Chuck

Below: SUPERPOWER
Magnetic Parallels and
V-Block



TP means TOP PRECISION

The Sidney Machine Tool Company			Sidney, Ohio	
Type Size & Model	Swing B=Over Bed R=Over Compound Rest G=Over Gap	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Gap Lathes				
14"	B=16 $\frac{1}{4}$ " ; R=9 $\frac{3}{4}$ " ; G=26 $\frac{1}{2}$ "		F=48; .0027" to .172"; S=12; 14 to 950 rpm; 5 to 7 $\frac{1}{2}$ hp	N=48 R=1 $\frac{1}{2}$ to 92
16"	B=18 $\frac{1}{2}$ " ; R=12"; G=28 $\frac{1}{2}$ "		do	do
18"	B=20 $\frac{1}{2}$ " ; R=12 $\frac{3}{4}$ " ; G=32 $\frac{1}{4}$ "		F=48; .0027" to .172"; S=12; 12 to 730 rpm; 7 $\frac{1}{2}$ to 15 hp	do
20"	B=22 $\frac{1}{2}$ " ; R=14 $\frac{3}{4}$ " ; G=34 $\frac{1}{4}$ "		do	do

Sundstrand Machine Tool Company			Rockford, Illinois
Type Size & Model	Swing W=Over Ways S=Over Cross Slide	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds
Automatic Lathes			
Model 4A	W=12¼"; S=8¾"	15", 24", 36"	F=.003" to .048"; S=60 to 1800 and 120 to 3600 rpm; 3 to 7½ hp
Model 8A	W=19½"; S=12½"	24", 36", 48", 60"	F=.004" to .070"; S=40 to 1200 and 80 to 2400 rpm; 10 to 25 hp
Model 12A	W=23⅛"; S=15¼"	24", 36", 48", 60"	F=.004" to .070"; S=30 to 900 and 60 to 1800 rpm; 20 to 50 hp
Model 16	W=24"; S=17"	36", 60", 84"	F=.0025" to .100"; S=15 to 750 rpm; 50 or 75 hp

Gisholt Machine Company			Madison, Wisconsin	
Type Size & Model	Swing B=Over Bedways P=Over Platen Table Chip Chute F=Over Front Carriage C=Over Carriage Bar	Distance between Centers	Horse Power F=Feeds S=Speeds	
Automatic Lathes				
Simplimatic Platen Table and Simplimatic Vertical Head	B=33½"; P=24½"		S=8 selections for each range: 16 to 321 rpm; 15-40 hp	
No. 12 Hydraulic	F=12"; C=16¼"	24"	F=.058" infinitely variable (max.); S=26 possible combinations within each range: 26 to 780 rpm; 7½-20 hp	
No. 24 do	B=35½"; F=28"	36"	F=.125" infinitely variable (max.); S=32 possible combinations within each range: 25 to 378 rpm; 25-75 hp	

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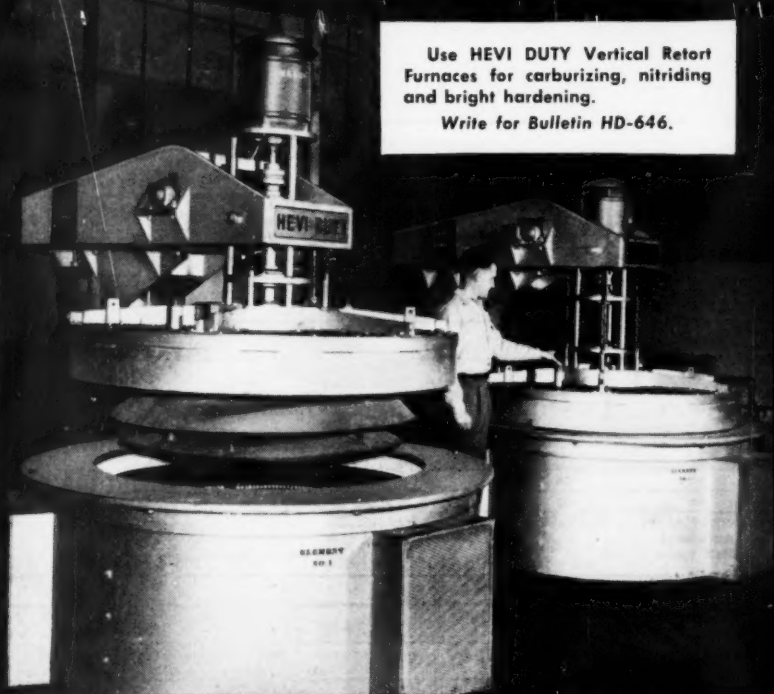
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Wickes Brothers		Saginaw, Michigan		
Type Size & Model	Swing B=Over Bed R=Over Compound Rest	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Engine Lathes 42" Heavy Duty Geared Head-Face Plate Drive	B=44 $\frac{1}{4}$ " ; R=29"	60"	F=56; .0065"-.724" S=8: 3 to 76.4 rpm-face plate drive; 1:5 to 38.2 rpm-face plate drive; alternative; S=16: 1.5 to 38.2 rpm-face plate drive; 6 to 152.8 rpm-direct spld. drive; 25 hp	N=56 R= $\frac{1}{2}$ to 56
48" do	B=50" ; R=35"	do	do	do
48" Extra Heavy Duty-Geared Head-Triple Geared Face Plate Drive	B=58" ; R=39"	96"	F=56; .006"-.700" S=16; .7 to 24 rpm-face plate drive; 2.8 to 96-direct spld. drive; 50 hp	do
60" Heavy Duty Geared Head-Face Plate Drive	B=69" ; R=48"	96"	F=56; .006"-.700" S=8; .7 to 24 rpm-face plate drive; S=16: 2.8 to 96 rpm-direct spld. drive; 50 hp	do

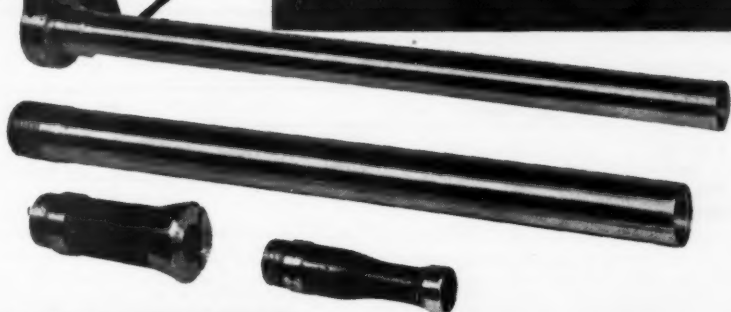
F. W. Derbyshire, Inc.		Waltham, Mass.			
Type Size & Model	Swing B=Over Bed R=Over Compound Rest	Length of Bed	Distance between Centers	Chuck Capacity	Speeds and Horse Power
Precision Lathes Model No. 750 Bench type	B=5.905" ; R=2 $\frac{3}{8}$ "	22"	12"	.004" to .315"	S=600 to 10,000 rpm; $\frac{1}{4}$ hp
Elect Lathes	B=4.72"	15" one pedestal	5 $\frac{1}{2}$ "	.315"	S=to 12,000 rpm; $\frac{1}{4}$ hp
do	do	18" two pedestals	8 $\frac{1}{2}$ "	do	do
do	do	22" two pedestals	12"	do	do
Magnus Lathes	B=3.94"	12" with pedestal	4"	do	
do	do	15" do	7"	do	
do	do	18" do	10"	do	
Model No. 45 Automatic Staff Lathe	B=5	10" do	1 $\frac{1}{8}$ " (between spindles)		1280 to 6000 rpm

Louis Levin & Son, Inc.		Los Angeles, Calif.		
Type Size & Model	Swing over Bed	Distance between Centers	Wire Chuck Capacity through Spindle	Travel of Tail-stock Spindle
Ball Bearing Lathes Model C	3.94"	3 $\frac{1}{2}$ "	.1968"	1 $\frac{1}{2}$
Model D	do	do	.315"	do
Cone Bearing Lathes Models B & H	do	4"	.1968"	do

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Reed-Prentice Corporation
Worcester, Mass.

Type Size & Model	Swing B=Over Bed C=Over Carriage	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
Precision Toolroom Lathes 14" Model AA	B=16½"; C=10¼"	30" to 150" in 24" increments	F=49; .0025" to .0016"; S=8 or 16; 18 to 785 rpm; 3-5-7½ hp	N=49 R=1½ to 96
14" Model B	do	do	do	do
Precision Engine Lathes 16" Model AA	B=18½"; C=12¼"	do	F=49; .0025" to .0016"; S=8 or 16; 14 to 611 rpm; 3-5-7½ hp	do
16" Model B 20" Sliding Gear Head	do B=21½"; C=15¼"	do 54", 78", 102", 126"	do F=41; .0025" to .080"; S=8 or 16; 12 to 530 rpm; 5 or 7½ hp	do N=41 3 to 96
Automatic Vertical Production Lathe	18" dia.-swing in clear; 14" dia.-swing over tool slides	30" std.	100 to 1-total overall feed range; S=24 to 1800 rpm; up to 50 hp	

Sloan & Chace Mfg. Co., Inc.
Kearney, N. J.

Type Size & Model	Swing	Collet Capacity	Distance between Centers	F=Feeds S=Speeds	Range of threads
Precision Bench Lathes No. 5	7"	13/32"	12" or 18"	F=20 threads to 1"; S=6; 125 to 1420 rpm	10 to 300 per inch
No. 5½	do	¾"	do	do	do
No. 3 Manufacturing and Self-Closing Types	5"	13/64"		S=6; 200 to 760 rpm- mfg. type; 420 to 1420 rpm-self-closing type	
No. 5 do	7"	13/32"		S=6; 125 to 760 rpm- mfg. type; 380 to 1420 rpm-self-closing type	
No. 5½ do	do	¾"			

Hardinge Brothers, Inc.
Elmira, New York

Type Size & Model	Swing B=Over Bed C=Over Carriage S=Over Cross Slide	Distance between Centers	Horse Power F=Range of feeds S=Speeds	Threading N=No. of threads that can be cut R=Range of threads
High Speed Precision Lathes Model HLX	B=11"; C=9"; S=5¼"	18"	F=¼" to 7" per min.; S=125 to 3000 rpm (var. spdle. speeds)	N=27 R=11 to 108
Model DV59	B=9"		S=8; 230 to 3500 rpm	

Rivett Lathe & Grinder, Inc.**Brighton, Boston, Mass.**

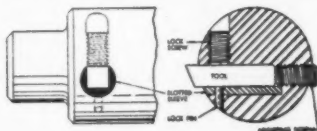
Type Size & Model	Swing B=Over Bed C=Over Carriage	Distance between Centers	Horse Power F=No. of and range of feeds S=Speeds	Threading N=No. of and threads that can be cut R=Range of threads
Precision Screw Cutting Lathe Model No. 608 Bench Oil Pan, Oak Cabinet, & Steel Cabinet	B=8½"; C=7½"	18¼"	F=.00220" to 0.0028"; S=12; 45-1300 rpm	N=33 R=10 to 144
Bench Lathe Model No. 715 Cabinet or Bench Mountings	B=7"	15"	S=8; 150 to 3500 rpm	
Precision Cabinet Lathe Model No. 918S Cabinet or Bench Mountings	B=9"	18"	S=8; 150 to 3750 rpm	
Precision Toolroom Lathe Model No. 1020S	B=12½"; C=7¼"	20"	F=.72; .001" to .060"; S=22 to 3600 rpm 3 to 5 hp	N=84 R=2 to 240

Porter-McLeod Machine Tool Company, Inc.**Hatfield, Massachusetts**

Type Size & Model	Swing B=Over Bed C=Over Carriage R=Over Compound Rest	Distance between Centers	Horse Power F=No. of and range of feeds per rev. S=Speeds	Threading N=No. of threads that can be cut R=Range of thrs.
Engine Lathe 16" Geared Hd. Quick Change Screw Cutting Model	B=17"; C=11½"; R=10¼"	36"	F=40; S=12; 15 to 500 rpm	N=40 R=2 to 56

Jones & Lamson Machine Company**Springfield, Vermont**

Type Size & Model	Swing C=Over Carriage Cb=Over Center Bar	Distance between Centers	Horse Power F=Range of feeds S=Speeds
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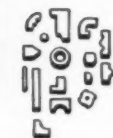
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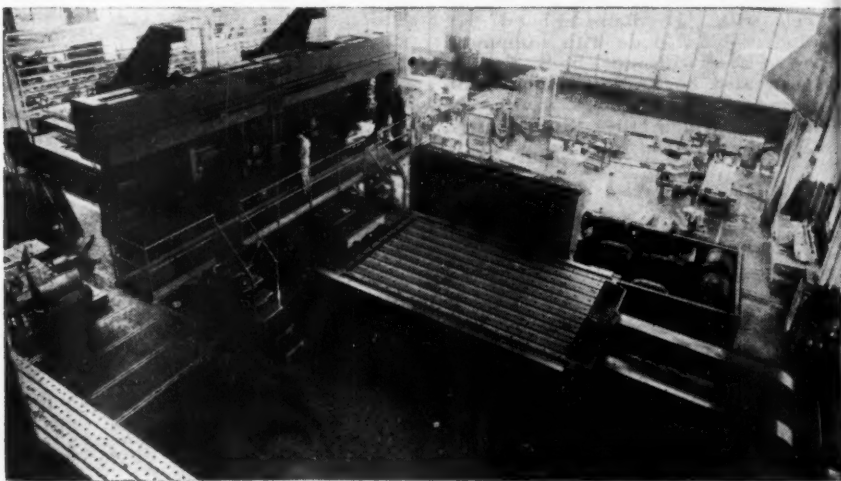
New machine mills aircraft skin panels from solid or rough-forged aluminum alloy plate

A NEW machine tool for the manufacturer of self-reinforced aircraft skins has just been developed. The machine will mill integral-rib skin panels from solid or rough-forged aluminum alloy plate. This manufacture of airplane surfaces and their stiffening elements as a unit will permit use of the thinner

wings and sharper fuselages required for high-speed jet flying. The machine will be used by the Lockheed Aircraft Corp. in the manufacture of F-94 jet fighters.

Replacing the customary forest of struts, braces and girders welded or riveted into the plane's structure, the

Giddings & Lewis' Hypro Aircraft Skin Mill (Type 100) . . . which will mill aircraft skin panels from solid or rough-forged aluminum alloy plate. This is the largest machine ever to be equipped with tracer control.



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integrally-braced surfaces are designed to make the new F-94 stronger, faster, and capable of carrying more fire power and greater fuel loads.

The machine operates in three dimensions with two feed motions, and is designed to work in a feed range from three-fourth of an inch to 150 inches a minute with infinite intermediate speeds.

Each of the three milling heads, two of which can be employed simultaneously, employs an Onsrud water-cooled unit powered by 100 hp G-E induction motor parts. Center and right head have individual vertical profiling systems to operate in plane of table or head travel with quick-change template. The left head is universal swiveling and has 360° profiling from templet. Also incorporated is a vertical rise-and-fall cutting action to control the variations in web thickness.

The massive machine (18 feet high, 30 feet wide, 80 feet long, and weighing 200 tons) will use 12 drive motors totaling approximately 350 horsepower, exclusive of 18 motors and generators delivering the power supply. A 20-hp motor will drive the table, with its 100-ton load capacity, and smaller motors will move the cutting heads on their guide rails.

Sequence speed control will feature operation of both the longitudinal and lateral feed motions. Both the table motion and the movement of the cutting heads can be operated at any selected speed.

Speed control and the steering control which guides the cutting angle are combined for ease of operation. Other novel features are the elimination of trailing hoses and electrical lines through use of a Giddings & Lewis Feed Reel, and a catwalk to give the operator a better view of the work in progress and to enable him to move easily from one side of the machine to the other.

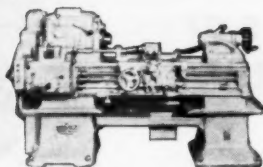
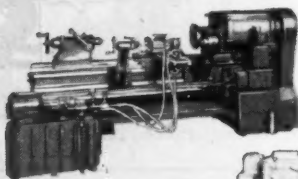
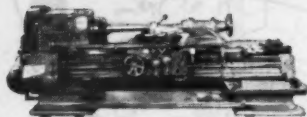
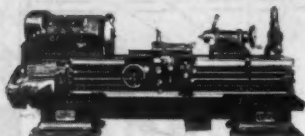
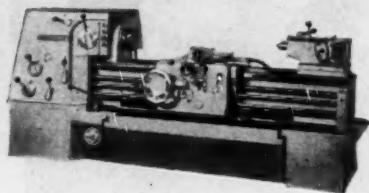
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BUSHINGS**

153

**UNIVERSAL
ENGINEERING COMPANY**
FRANKENMUTH 10, MICHIGAN

chine are: work area is 10 feet wide x 34 feet long; clearance under cutters is 48"; a cutting speed up to 10,000 feet per minute is possible, with a maximum metal removal of 600 cu. inches; chips are removed automatically by means of conveyor belts located in back of the heads; machine mills angular paths to dial setting; mist lubricated spindle bearings and head gears.

The machine was jointly designed by engineers of the Giddings & Lewis Machine Tool Co., the General Electric Co., and Lockheed Aircraft Corp.



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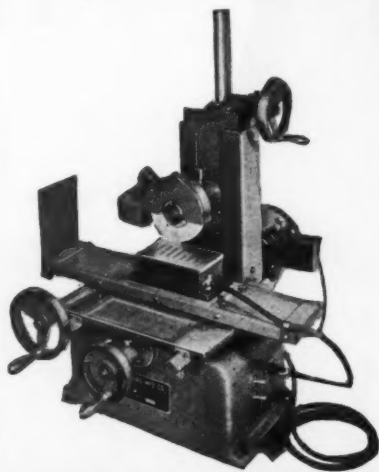
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for punching and
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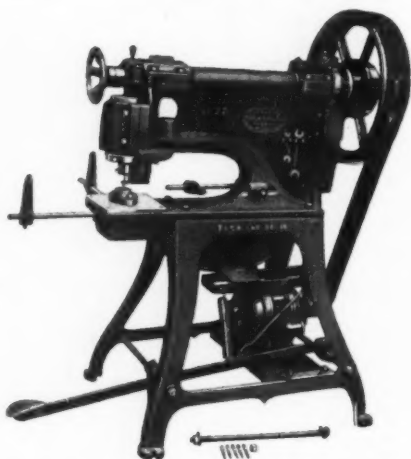
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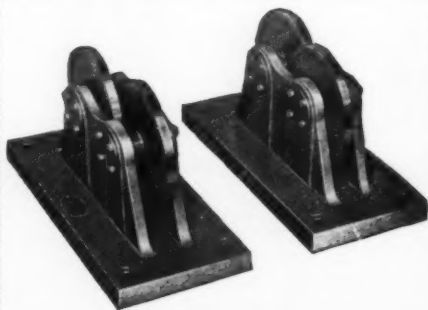
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that equip you to mill
small and medium-sized parts
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The greatest service you can render to your company today, is to make sure that your plant facilities are prepared to meet increasing demands for accurately-made small and medium-sized parts at low cost.

That is why it will pay you to investigate the three manufacturing-type Brown & Sharpe Milling Machines shown here. They are specifically designed for mass producing milled parts, with uniformly high precision and minimum demand on the operator's time and attention. Adapted to an almost endless variety of jobs, they assure you continuing big returns on a moderate capital investment. Write for detailed catalog and specifications. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

No. 12 PLAIN MILLING MACHINE 3 h.p. Spindle Drive

Complete electrical control of all power movements gives unusually precise, smooth performance with outstanding ease and flexibility. Wide variety of automatic cycles obtainable, with time-saving dual feed rate. Ample capacity for majority of medium-sized work. Climb milling in either direction.

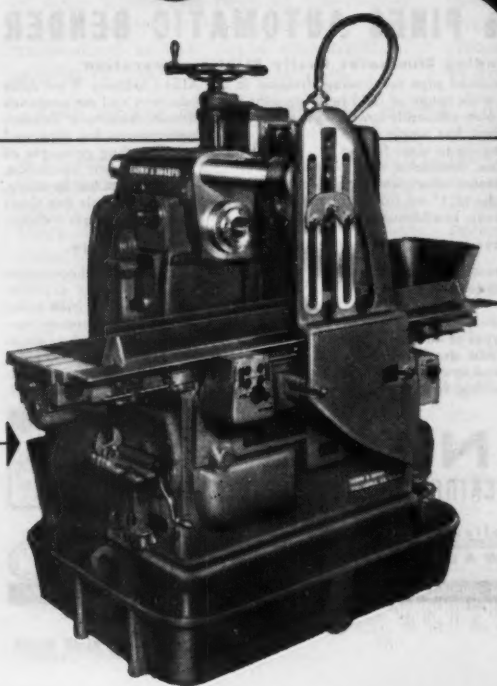
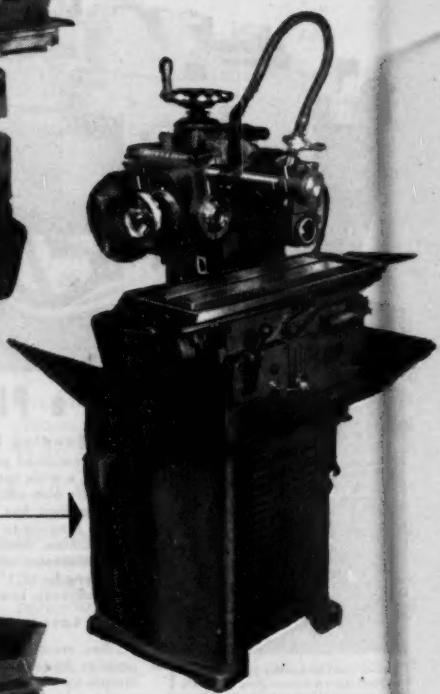
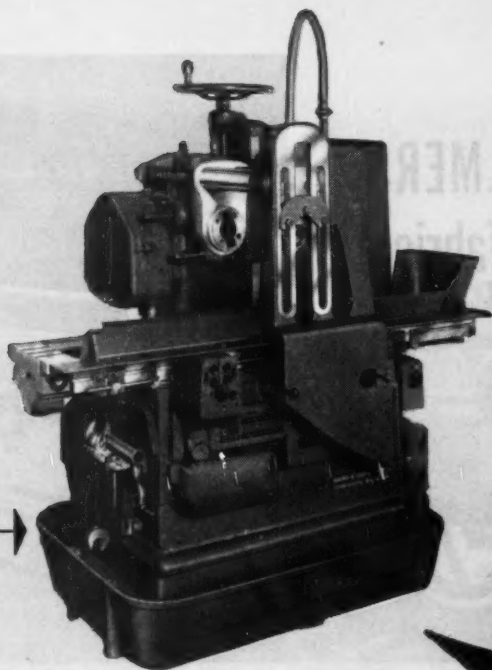
No. 000 PLAIN MILLING MACHINE 1/2 h.p. Spindle Drive

For economical, fast production of small pieces such as parts for firearms, radios, etc. Automatic cycle and minimum fatigue for operator afford uniform production rate. Uniform feed gives long cutter life.

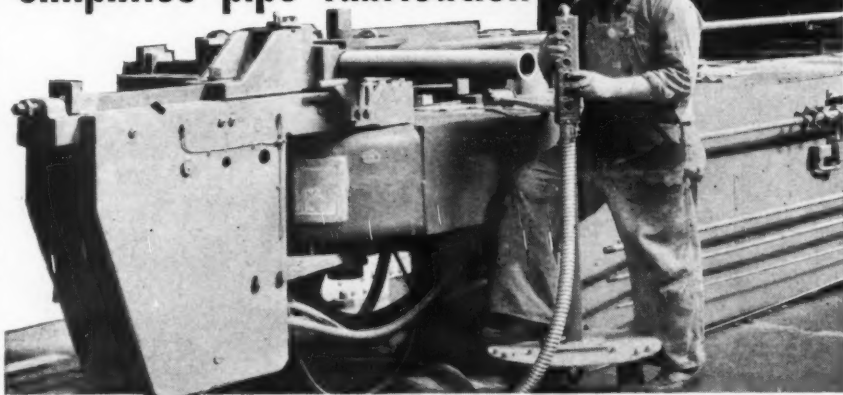
No. 12 PLAIN MILLING MACHINE 7 1/2 h.p. Spindle Drive

Same features and advantages as the 3 h.p. model, but powered for heavier cuts, including many moderate-sized carbide milling jobs.

Brown & Sharpe 



How ALLIS-CHALMERS simplifies pipe fabrication



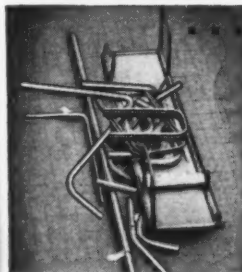
with a PINES AUTOMATIC BENDER

Cold Bending Eliminates Costly Pickling Operation

In a centralized pipe fabricating division at the Allis-Chalmers West Allis Works, a wide range of cold bending jobs for production and maintenance needs are now efficiently handled on this Pines Hydraulic Automatic Bender. The machine has ample capacity for handling requirements for pipe and tubing ranging in sizes from 3/4" thru 5". The cold bending principle of the machine, combined with push-button control and automatic operation, reduces manual effort, and cuts costs. For example, in place of hot bending, long lengths of 3" oil line piping are now cold formed at speeds five times more efficient. In addition, a costly cleaning and pickling operation is avoided.

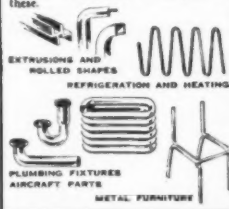
Small Lots Handled Profitably—Low Tooling Expense

Further, most small lot jobs are handled profitably. The centralized operation permits standardizing on radii of bends which lowers tooling expense. Simplicity of tooling and quick change-over features of the machine saves set-up time. The capacity and versatility of the equipment also permits handling all types of materials and shapes suitable to cold bending, such as stainless steel and chrome-moly tubing, extra heavy wall piping, channel iron, extruded and structural shapes. Thus, with modernized equipment and skillful engineering, fabricating and assembly work at A-C are greatly simplified.



View of small lot bending jobs performed on Pines Size 4 Automatic Bender. Smooth, accurate bends are formed without wrinkles or distortion.

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Five-year amortization, or the tax education of Joe Jones

by Irving S. Olds

Chairman of the Board
United States Steel Corp.

Of all the domestic issues that are now under popular discussion, I know of none which has been so thoroughly misrepresented and so completely misunderstood as the "rapid amortization" section of the 1950 Revenue Act.

Even among the members of Congress who enacted this measure there is an erroneous belief that it grants a tax subsidy to business. Certain Washington observers have implied that there is some undefined and hidden scandal about the operation of this statute, and, in some quarters, there seems to be a studied attempt to use this suggestion of scandal as a lever with which to force public acceptance of a program of government construction and ownership of defense plants.

That such misunderstanding and confusion exists in Washington and elsewhere is not surprising, of course; for it is almost impossible to discuss this complicated tax issue without getting lost in a maze of technical accounting terms such as "amortization," "depreciation" and "write-offs."

In my opinion, however, the root of most of this confusion is to be found in the fact that the word "profit" means one very distinct thing to the average citizen, and an entirely different thing to an accountant or a tax collector.

To the citizen, a profit means exactly what the dictionary says it does: the amount by which receipts exceed expenses in a business transaction. It is money and it is spendable. The tax collector, however, deals often in profits

On May 3rd, 1951, Mr. Olds delivered a speech before the annual meeting of the Chamber of Commerce of the State of New York on the "rapid amortization" section of the 1950 Revenue Act. Mr. Olds' logic and simplicity of representation, spiced with a delightful wryness, should clarify the controversial five-year amortization section, and bludgeon to death the misguided belief that industry is obtaining a tax subsidy from the government.

which are wholly fictitious and which exist only on paper. Most businessmen, moreover, have become so accustomed to paying taxes on these fictitious paper profits that they have virtually forgotten what a real cash profit is.

It is this confusion of terms which is responsible for much of the present controversy. To a high degree, it is a matter of semantics. For instance, it is said that the law permits a manufacturer to write off his investment over a certain number of years; when as a matter of actual fact the law sternly compels him to wait that number of years before he can recover fully—out of his own business income—the money which he, himself, has spent for the plants and facilities in question.

It seems to me that if we could only view this law through the eyes—for example—of citizen Joe Jones, and see for ourselves how it would affect him in his business, much of the misunderstanding which prevails so generally today would simply evaporate. Let us say that our Mr. Jones came home from the last war, found a small job which provides his support, but nurtured a strong desire to start a business of his own in the hope, some day, of becoming his own boss. Perhaps I should add here the usual warning that any resemblance between Joe and any person, living or dead, is entirely coincidental. But having cast this anchor securely to windward, I should like, for the next few minutes, to put myself in his shoes, to see through his eyes, and to describe in his words the problems he meets as he launches his business career.

Joe decides to make a "whatzit".

So—as Joe—I look around and decide that what this country needs is a brand new gadget. Moreover, I think I know just what that gadget is and

how to make it. Maybe it's a better mousetrap. Maybe it's something else. Let's just call it a "whatzit."

In any event, I find that to manufacture this product, the first thing I'll need is a machine that costs \$2,000. Then I'll need the raw materials, and a man to run the machine.

So, for the purposes of this illustration, I incorporate myself, and go around to my good old Aunt Mathilda, who generously agrees to pawn the family jewels and to lend me the \$2,000. I buy the machine, set it up in my basement, hire a man, get the raw materials, and the Whatzit Manufacturing Company, Inc. is open for business. Then I go out and establish a market for my product, and sure enough, it sells.

Everything is going fine, and at the end of the first year I start to figure out where I stand. That's fairly easy.

I find I sold exactly \$10,000 worth of whatzits, so there are my total receipts—\$10,000.

Next I come to expenses. The first thing I spent, of course, was \$2,000 for the machine, so I put that down. Then I put down all my other expenses—let's call them my "running expenses"—labor, raw materials, light and power, maintenance and repair of the machine, and my selling expenses, advertising, and so forth. And these running expenses come to precisely \$8,000. So I find that I broke exactly even.

My tax return is very simple: receipts, \$10,000; expenses, \$10,000; no profit; no tax.

I send the tax return to the collector; drop around and repay the \$2,000 to my Aunt Mathilda, who is overjoyed; and I come home feeling pretty good. I've worked a whole year, and while I haven't made a dime, I haven't lost a dime either. Moreover, I've established a good business, and next year—if all goes well—I should make a profit for the first time.

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Range 0-1" by .0001"
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Often imitated, never equalled, Starrett Micrometers are the standard by which others are judged. Precision made throughout by Starrett precision methods based on 70 years of micrometer manufacturing know-how . . . plus 12 big features that insure better, faster measuring. Ask your distributor to show you Starrett Micrometers designed to simplify your precision measuring jobs. You'll agree, they're the finest micrometers ever to carry the Starrett name.

INSIST ON THESE BIG FEATURES

For Better, Faster, Precision Measuring

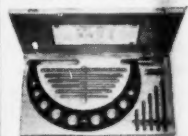
- 1 TAPERED FRAME** — Permits measurements in narrow slots and tight places. Standard on all full finish outside micrometers.
- 2 CONVENIENT DECIMAL EQUIVALENTS** — Of 8ths, 16ths, 32nds and 64ths on frame or thimble.
- 3 HI-MICRO MIRROR FINISH** — On faces of anvils and spindles insures more accurate measurements. Also available with tungsten carbide faces for severe abrasive conditions.
- 4 ONE PIECE SPINDLE** — For long, accurate life.
- 5 QUICK READING FIGURES** — Every graduation numbered for positive identification.
- 6 LOCK NUT** — Permits locking of spindle at any reading. Available at slight additional cost.
- 7 SIMPLE SLEEVE ADJUSTMENT** — Maintains Starrett accuracy.
- 8 SATIN CHROME FINISH** — On thimble and sleeve of all micrometers and on frame of all full finish micrometers.
- 9 NO GLARE** — Easy reading Satin Chrome finish eliminates squinting and eye strain.
- 10 RESISTS RUST** — Satin Chrome finish highly resistant to stains and corrosion.
- 11 HARDENED THREADS** — Ground from the solid and stabilized to insure lasting precision.
- 12 RATCHET STOP OR THIMBLE FRICTION** — Permits consistent measurements independent of "feel" — Available at slight additional cost.



Tubular Micrometers No. 724
— Bow type. Light yet rigid for precision measurements on large work. Standard sizes up to 60". Larger sizes on special order. Bar types also available.



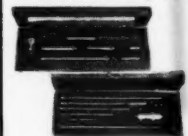
Black Frame Micrometers
No. 436, Range 1" by thousandths in 24 sizes from 1 to 24 inches. Supplied singly or in sets. Also available with .0001" graduation.



Interchangeable Anvil Micrometers No. 224 — Ranges 0-4, 2-6, 6-9, 6-12, 9-12, 12-16, 16-20 and 20-24 by .001". Available singly or in sets. Interchangeable anvils mean big capacity plus saving in tool equipment.



Steel Mill Micrometers
No. 303. For gaging hot metal. Heavy duty spindle, heavy end graduations, wing head lock nut, "Satin Chrome" finish. Range 0-1".



"Satin Chrome" Inside Micrometers
No. 823 — with tubular rods.
No. 124 — with solid rods.



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DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK
HACKSAWS, BAND SAWS and BAND KNIVES

So I come whistling down the street, turn in at the front gate, and there—sitting on the doorstep—is a gentleman from the Internal Revenue bureau, who wants to ask me just one, simple little question:

"Whaddaya mean, no profit?"

Well, I take him in and show him my books and they don't faze him at all. He just looks over at the corner and says, "How about that machine? It's all yours now, isn't it? You own it now, don't you?"

I say, "Of course I own it. I bought it, and I paid for it. That was my very first item of business expense."

Well, he looks at me kind of sadly and says, "Listen, Pal, this may come as a great shock to you, but that machine isn't an expense—it's a profit. You can't spend it, or eat it, or wear it; but just the same, it's profit!"

Well, of course, I can't see that at

all, and I tell him so. I paid \$2,000 for that machine, and until I get that money back, I haven't made any profit at all. That's all there is to it, and that's the way it really is! But he shakes his head and says:

"Look, Bud, it might sound that way to an ordinary guy, but life just isn't that simple—not when you're dealing with the government, at least. You're a businessman now, and you've got to start thinking like a certified public accountant, or a tax collector, or maybe even like a chairman of the board. That machine represents a capital expenditure and you've got to amortize it or depreciate it."

Well, I tell him that I'm certainly not going to do anything like that to a perfectly good machine; and he can see I'm getting pretty sore about it, so he explains it to me very patiently.

"It's like this," he says. "You paid for that machine, and you're entitled

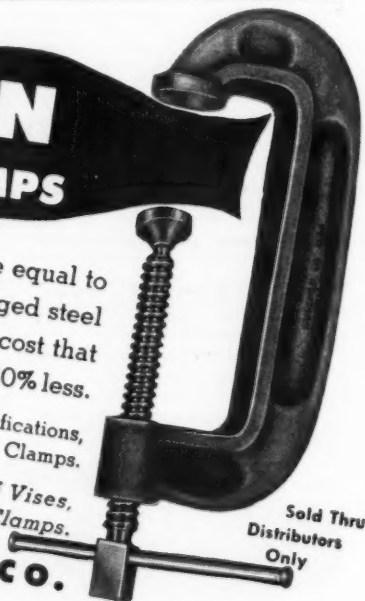
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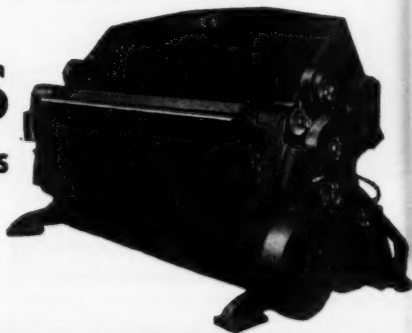
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Production or short-run keyway cutting can be accomplished in all types of bushings, sleeves, gears, etc., with the GLENNY adjustable push broach. Featuring 0.0005-inch accuracy, it can be instantly adjusted and micrometer checked for precision operations.

SPECIFY GLENNY... greater strength... maximum accuracy... fully adjustable for depth... interchangeable high-speed blades... bushing adapters available... will cut tapered keyways... hardened tool-steel external parts.

GLENNY broach sets are available for cutting keyways in bores ranging in diameter from $\frac{1}{4}$ " to $2\frac{1}{2}$ ".



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Please send (without obligation) your new Bulletin No. 13 containing sizes, specifications and prices of GLENNY broaches and kits.

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to recover—out of your earnings—all the money you put into it. If you couldn't do that, you wouldn't go into business in the first place and neither would anybody else. So up to that point we agree. But here's the catch in it. You're not entitled to get your money back all 'in one fell swoop'—as Shakespeare used to say. The law says you have to spread out the cost of that machine over its entire useful life. If we think it will last five years, we let you recover one-fifth of its original cost each year, out of your earnings. If we think it will last ten years, you can get one-tenth of your money back each year, and so on. Now it happens that the particular machine you have over there is good for twenty years, so we will let you 'depreciate' it at the rate of five percent per year. That's what we mean by amortization."

"You may call it amortization," I tell him,

"but I call it an outrage."

What you're saying is that I've got to wait twenty years to get back the money that I had to pay, cash-on-the-barrel-head, in one year."

"Put it that way if you want to," he agrees amiably, "but that's what the law says and that's the way it's going to be—or else! Now let's figure your income tax the way you should have figured it. You took in \$10,000 and spent \$8,000 for what you call 'running expenses.' That leaves \$2,000, which you might call your 'operating profit.' Now, out of the \$2,000 you write off \$100 to cover depreciation on the machine . . ."

"Wait a minute," I interrupt. "How do I 'write off' a hundred bucks?"

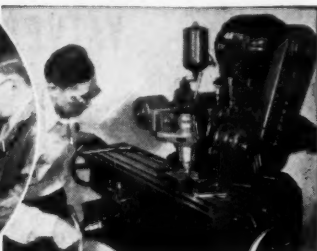
"Easy," he says. "You just take the hundred and put it in a bank, and you do the same thing every year for twenty years. At the end of that twenty years, your machine is all worn out and useless, but over in the bank you've got

ACCURACY TO .0001"

FOR TOOL ROOM AND PRODUCTION

FOR LESS THAN
\$150

IN PRECISE MOUNTS ON LATHES AND OTHER MACHINE TOOLS, PRECISE GRINDER-MILLERS WITH 1/4 H.P. AND SPEEDS FROM 20,000 TO 45,000 R.P.M. DO THE WORK OF SINGLE-PURPOSE MACHINES COSTING 100 TIMES AS MUCH!



VERSATILITY. For cylindrical, internal, external and form grinding; for milling with H. S. steel or tungsten carbide midjet mills; for micro-finishing and polishing. Use on wood, glass, rubber, plastics, or any metal including the hardest alloy steel.

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ATTACHABLE COOLFLEX SHAFT (optional). Quickly attached for bench work and handtool applications. Same speeds, same precision quill as in PRECISE GRINDER-MILLERS.

PRECISE PRODUCTS CO.,

Write FOR CATALOG
1341 Clark St., Racine, Wis.

PRECISE GRINDER-MILLERS

the \$2,000 you paid for it. so everybody's happy."

Well, of course, I'm not very happy about it at all, and I ask him just one question: "What happens if I don't earn enough in future years to cover that \$100 depreciation? Suppose there isn't any 'operating profit,' as you call it?"

"Brother," he says, "take my advice and don't let that happen. If it does, then hire yourself a smart tax lawyer, because right there the law gets aw-

fully complicated. But in any event, it's your worry, not mine." And with that he gets out his pencil and starts figuring my income tax.

Now, gentlemen, for the purposes of this little illustration, let us assume that the tax rate applicable to this particular business is 50 percent. Actually, of course, on a small corporation of this kind it would be lower than that, and on a big corporation it would be higher than that.

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PRECISION BUILT

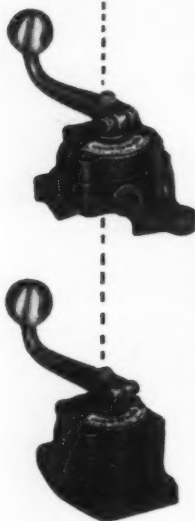
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1"
4



For tubing or piping . . . for small air or hydraulic cylinder control . . . for pilot control of larger valves, and for many other uses, Hanna 1/4" Valves are perfectly suited.

They are packless, permanently tight and designed with the skill and precision that distinguish all Hanna products. A feature of these Unitite Jrs. is the handy control lever which requires only 80° movement to effect a complete reversal. Essentially 4-way valves, they operate equally as well as 3-way valves—simply by plugging any one port.

Three mounting styles—standard mount, column mount, and manifold mount, are available to meet your requirements. All operate with pressures up to 500 p.s.i., for air, oil or water.

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Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT CYLINDERS VALVES PISTONS

1754 Elston Avenue, Chicago 22, Illinois

But just to keep it simple, let's call it 50 percent.

So the Internal Revenue man gets through with his figuring and says, "Congratulations, my friend. You made a very handsome little profit this year. After paying all your running expenses, and after writing off that \$100 to cover depreciation on your machine, you had \$1,900 left. That is your taxable income. Now you owe me half of that, which is \$950; and that leaves a

clear profit of \$950 for you. That's nice going."

"It's nice goin' for you all right," I agree, "but there's just one little thing that puzzles me. If I really made a \$950 profit, the way you say I did, I certainly ought to have enough money around here somewhere to pay my tax with. But I haven't got a nickel. So what do I do about it?"

"Buddy," he says, in a kind of friendly tone, "if you don't want to

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ON reaming and other circular cutting jobs in the plant is where Staples reputation for quality is made and proven.

On job after job, Staples Carbide-Tipped Expansion Reamers and other circular cutting tools boost output per tool and per hour while maintaining close tolerance and maximum precision.

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Carbide-Tipped Cutting Tools**

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A COMPLETE LINE OF
CIRCULAR CARBIDE-TIPPED CUTTING TOOLS
EXPANSION REAMERS—SPECIAL TOOLS

spend the next ten years in Alcatraz, you'd better run over and see your Aunt Mathilda!"

And there, gentlemen, you have the first chapter in the story of the tax education of Joe Jones. That's how he found out about amortization, depreciation and write-offs—the hard way. And that, also, is how he began to pay a corporation income tax on a paper profit that he had never really received in

cash and would not receive in full until the end of twenty years.

Naturally, Joe felt that he had been gypped; and if you look at it through his eyes, he had been. But he realized that every other corporation in the country was being taxed in the same way, and there was nothing he could do about it. So he went ahead for five years, manufacturing and selling his gadgets, and by a strange coincidence,

*Thousands upon
Thousands...*



Zagar 2" holding fixture

Zagar 5-C pull type collet

PROMPT DELIVERIES

Zagar 1" indexing fixture

• Thousands upon thousands of Zagar collets, holding and indexing fixtures called into service before World War II began are still performing most profitably. *Advantages:* No vertical movement of collet. Chips self-clearing. Close tolerances. Top production with extreme accuracy. For slot milling, straddle milling, drilling, tapping, grinding.

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Zagar **TOOLS FOR INDUSTRY
and SPECIAL MACHINERY**

which occurs only for the purpose of this illustration, his receipts remained exactly the same, each year, and so did his running expenses and his tax rate. Every year he put aside a hundred dollars to cover depreciation on the machine, and every year he paid the government \$950 in taxes.

Then, one day, an army officer from Washington walks into the shop and says,

**"Joe, we're in trouble,
and we need your help."**

"Sure," says Joe, "anything at all. What can I do for you, Major?"

"Well, it's like this," the major explains. "You know all about the police action in Korea and the present national emergency. We've got to build up our defenses very quickly; and the army needs a whole lot of those what-

Production Pointers

from

GISHOLT

TIME
SAVING
IDEAS



Why Gisholt's Recommendations Are Unbiased—In helping you solve your turning problems, Gisholt engineers have no reason to favor one type of machine over another except on the basis of its ability to best serve your needs. For Gisholt manufactures both manually operated turret lathes and automatic lathes.

C/F TURRET LATHE HANDLES AWKWARD PART

Face Plate Fixture Economical for Small Lots

The irregular shape of these bar feed bodies presents quite a chucking problem. That, combined with small lot production, means a real problem. We are solving this problem in our shop by putting the job on a 5L Saddle Type Turret Lathe.

A special face plate fixture is mounted on the face of the 32" Gisholt scroll chuck. This is counterweighted to permit using higher spindle speeds. The part is quickly bolted to the fixture for multiple boring, counterboring and facing operations. After the 1st operation part is removed, a

spacer added to the fixture, the part is turned over, and 2nd operation is performed. The cost of the fixture is more than made up by the rapid handling of the job.

C/F Turret Helps Simplify Job

Turret tooling is at a minimum. A single tool bit in the square turret handles facing of the hub and intermittent facing cuts. A single boring bar in the cross feeding hexa-

gon turret handles the rough and finish cuts in the bore and counterbores. Thus, simplified tooling keeps down the investment and reduces setup time. The rigid construction of the machine permits simultaneous use of the square and hexagon turrets for further savings.

Simple tooling, plus simultaneous machining from both turrets and a counterweighted face plate, result in maximum efficiency.

Are You Missing a Bet?

Every "old-timer" in your shop knows the value of combined cuts on a turret lathe. But, many new men have not learned to save time by using the hexagon and square turrets at the same time. Watch for this in your shop . . . it will help you increase production.



This close-up shows how a smart setup can make a fast, easy job out of an otherwise slow and awkward one. Note the special counterweighted face plate.



Machined part after boring and facing the diameters and support bearing surfaces.

New literature describing the 5L Saddle Type Turret Lathe is now available.

FOR MORE PRODUCTION FROM A GOOD WAY TO MACHINE PULLEYS

From Rough Casting to Finished 2-Step Pulley in 1.2 Minutes

Suppose you got a large order for pulleys like these. How would you handle the job?

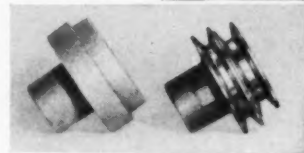
This manufacturer does it right... on a Gisholt No. 12 Hydraulic Automatic Lathe. The 5" parts are held in a 3-jaw air chuck. An air-operated tailstock supports the piece under heavy cuts.

On the front carriage is a special combination tool block with two turning tools mounted above the work and five grooving and facing tools at the side. The rear slide has a skiving tool mounted underneath the work and a form tool on centers. The cycle:

1. Front carriage feeds left and turns the 2 diameters with overhead tools.
2. Feed changes from longitudinal to cross feed, and lower tools rough out the grooves and straddle-face

This No. 12 Hydraulic with 5 sets of tools completes 2-step pulley every 1.2 minutes.

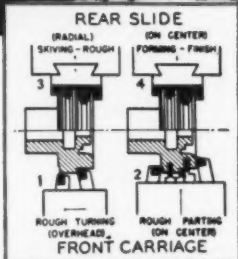
Rough casting and finished pulley.



both ends. 3. Rear slide brings in skiving tool to rough form grooves. Tools are below centerline and pass beyond after completing work. 4. Forming tools feed in on centerline to finish job.

Time: 1.2 min., floor to floor.

Multiple cuts with four sets of tools provide fast, automatic production at minimum cost.



Drawing shows 4 sets of tools that do entire pulley machining job.

DELICATE PARTS GET GENTLE TREATMENT FROM RAM TYPE TURRET LATHE

Special Tooling Simplifies Machining of Cream Separator Bowls

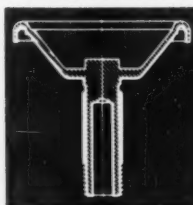
This Ram Type Turret Lathe has the tricky job of machining the tubular shaft and base for cream separator bowls.

Support for the long, rather weak stem is provided by a roller rest turner mounted on the hexagon turret. On the third turret face is an adjustable head with four tools for machining the bottom surfaces of the conical base.

Point Tool Generates Angle

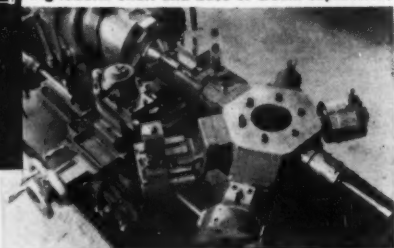
The conical surface is nicely handled with a special angular mounted tool slide on the back of the square turret cross slide. Because this surface is too wide, and because the material is rather difficult to form or shave with a single

broad tool, this angle is generated with a single point tool at the same time the drill does the center hole. There is a pusher plate on the face of the drill holder which, as the hexagon turret advances, contacts the roller on the angular slide and pushes this to turn the cone at same time.



Heavy lines show the many machining operations on these parts for cream separators.

Tooling on Gisholt Ram Type Lathe for machining tubular shaft and base of cream separators.



MAN-HOURS AND MACHINES

TIME
SAVING
IDEAS



A SMART SETUP FOR HYDRAULIC VALVE BODIES

Minimum Changeover on Fastermatic

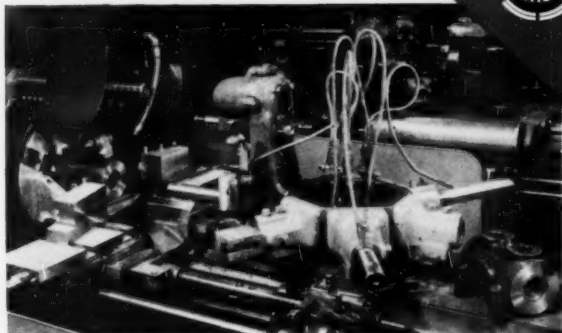
Perhaps you can use this idea: an automatic turret lathe set up to handle four different sizes of valve bodies, requiring such minor changes as spacers in the holding fixtures, individual drills, boring bars, etc. The machine is a Gisholt 1F Fastermatic.

The work itself is simple enough. It begins with a boring bar that sizes the cored hole—just deep enough to give the core drill a true start. The core drill is followed by counterboring, chamfering, finish boring and facing.

Tool Relief Provided

A conventional boring bar does the finish boring. When the cut is completed, a stop bar and cam move the entire bar toward the spindle centerline so it may be withdrawn without leaving a "snake track."

The tool blocks of the independent front and rear cross slides have adjustable slide tops and are fitted with T-slot mounting bases. The rear slide, which does the finish facing, is equipped with hydraulic tool relief. After the cut, the slide tips away.

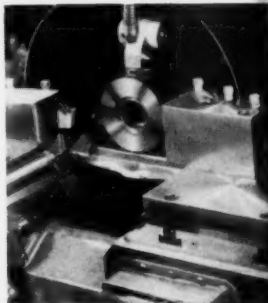


Fastermatic set up for finishing valve bodies. Note completed part on machine at right.

from the work several thousandths to permit the tool to clear the work as the slide is retracted.

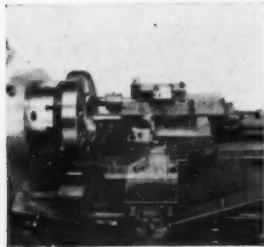
All operations are performed automatically by the Fastermatic. It's the ideal way to handle such work—with one operator able to handle two or more machines. Catalog on request.

The Fastermatic handles a number of rough and finish cuts in one chucking and allows simple changes for difficult sizes—all with a standard automatic cycle and with tool relief where needed.



Close-up of rear slide equipped with hydraulic tool relief for clearing work after facing.

HERE'S THE RIGHT COMBINATION FOR FASTER FINISHING OF DIFFERENTIAL CARRIERS



Tool slide arrangement for machining gear carriers.

Simplimatic Brings More Tools to Bear on Work

The photo shows second operations on a differential carrier—the kind of job that's a "natural" for this Simplimatic Automatic Lathe.

The wide platen accommodates individual tool slides with each slide feeding in the desired direction and at its own rate of feed. This permits each of the required number of cuts to be made in the most advantageous manner.

Operations are: turning the O.D., straddle facing both sides of the rim, facing and counterboring the hub, and at the same time, finishing the spherical bore in the center with a swinging tool actuated from the front tool slide.

The large platen table permits a choice of slide arrangements so each tool can work to best advantage. This makes it the equivalent of a "special" machine designed for high production work.





TIME
SAVING
IDEAS

MEASURES AND CORRECTS UNBALANCE IN COMPLETE CRANKSHAFT ASSEMBLIES

Gisholt Balancer Combines Two Types of Correction Equipment

Here is the way crankshaft assemblies are balanced by one large automobile manufacturer. A type "S" Double End Drive Balancing Machine locates and measures dynamic unbalance in two parts of the assemblies—and then proceeds to make correction by two different methods.

When correction is made on the fluid coupling, weight is *added* to the light side by welding on a slug of the proper weight (as indicated by machine). Welding equipment is mounted on the back of the machine.

In correcting unbalance in the clutch, weight is *removed*



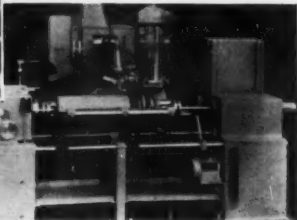
from the heavy side of the part. A drill press for this operation is also mounted on the balancing machine.

This machine illustrates again how Gisholt balancing equipment is adaptable for virtually every balancing problem. Booklet, *Balancing Machines*, has full information. Write for it.

With special correction equipment this machine locates, measures and corrects unbalance—all without removing workpiece.

Assembly ready for balancing.

Balancing Machine with welder and drill press for two methods of correction on crankshaft assemblies.



Gisholt Balancing School
Complete courses covering theory and practical applications of balancing. Get details. Type "S" course starts Sept. 10th.

DYNATRIC
BALANCERS



MANUFACTURED BY THE
GISHOLT MACHINE COMPANY
MADISON, WISCONSIN
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MANUFACTURE EXCLUSIVE CORPORATION

SLITTER SAWS—BEFORE AND AFTER SUPERFINISHING!

Saw Blade Life Increased Six Times by Superfinishing

These two charts show the amazing difference in surface finish of slitter saw blades before and after Superfinishing.

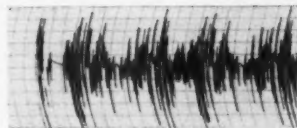
"Before" shows how the blades formerly were used in our shop. This way, however, the blades had a tendency to pick up material and bind. This galling shortened the useful life of the blade and caused rejects.

Now, all blades are Superfinished. From an average surface finish of 10 micro inches RMS, both sides are Superfinished down to 1 micro inch RMS. This results in *six times longer blade life*—offsetting many times the cost of Superfinishing. Binding is

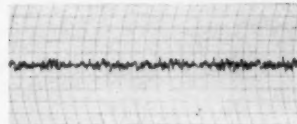
greatly lessened. There's less scoring trouble.

This rather unusual use of Superfinishing shows the wide application of this modern process. Write for your copy of *Wear and Surface Finish*.

Superfinishing greatly extends the life of saw blades, reduces binding and scoring, pays real dividends.



These charts show before and after Superfinishing of saw blades. "Before" surface is approximately 10 micro inches RMS. "After" is 1 micro inch RMS.



Note lack of striations on Superfinished surface of top blade. Lower right shows blade not Superfinished and, lower left, what happens to this blade in service.

No. 851
375A



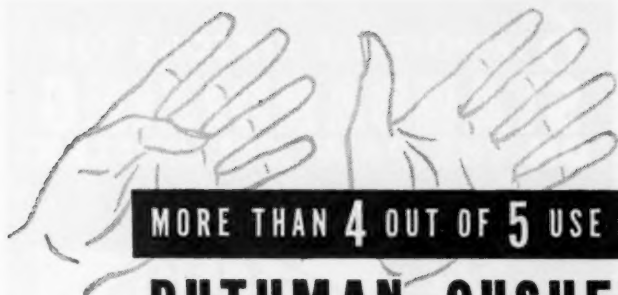
The Gisholt Round Table represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY

MADISON 10, WISCONSIN

A general catalog on machines listed below is available on request.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



MORE THAN 4 OUT OF 5 USE

RUTHMAN GUSHER

Machine Tool Coolant Pumps



There's a good reason why four out of five of the leading manufacturers of metal-cutting equipment regularly supply Gusher Coolant Pumps on their machines. They know from experience that Gusher Pumps are more dependable and longer lasting.

Gusher Pumps are built by *Ruthman*, designers and originators of the vertical motorized machine tool coolant pump and their skill and experience is continually directed toward giving you a better, more advanced coolant pump. Follow the leaders—specify Gusher Coolant Pumps on your machines.

THE RUTHMAN MACHINERY CO.

1816 READING ROAD

CINCINNATI, OHIO

zits that you're making. So we want you to put in another machine, hire another man, and double your output. Will you do it, Joe?"

"You bet I will," says Joe. "Just tell me how I get the machine. You see I don't yet have enough money to buy another one, and my Aunt Mathilda died last year, and . . . well, what do I do?"

"I'm afraid that's up to you, Joe," the major replies. "You're going to have to buy the machine yourself and pay for it, just as you did before. There's not a thing I can do about that; but Congress has just passed a new law that ought to help you swing the deal."

"What law is that?" asks Joe, pulling up a packing case for the major to sit on.

6 IMPORTANT REASONS FOR STANDARDIZING ON THE P&W KELLERFLEX

Carbide



TRADE MARK

1. MASTER GROUND BY MACHINE

to give uniform flutes
and teeth of even
height.

2. EXCLUSIVE DEEP FLUTING for free chip clear- ance.

3. RUNS AT 1/2 USUAL SPEEDS to produce finer finishes.

4. NO SHARP SLIVERS

— instead, harmless
granules, easy on the
hands.

5. EASILY CONTROLLED — won't "walk" away from work.

6. MUCH MORE PROFITABLE because less wear and tear on operator, and on machine.

**PRATT &
WHITNEY**

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WEST HARTFORD, CONNECTICUT



Made in over 50 shapes and sizes.
Order from your nearby P&W
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(The Stanco Co.) • Los Angeles
New York • Philadelphia
Pittsburgh • Rochester • St. Louis
San Francisco • and from Factory Stock
at West Hartford, Conn. *Office Only

So the major describes the new amortization provisions of the Revenue Act and tells Joe, frankly and clearly, just what they will and will not do for him. He explains that Joe is entitled to apply to Washington for a certificate, showing that the new machine is necessary to the defense program. When and if he gets that certificate of necessity—and after his new machine is installed—Joe will then be allowed to "write off" a large part of the cost of the ma-

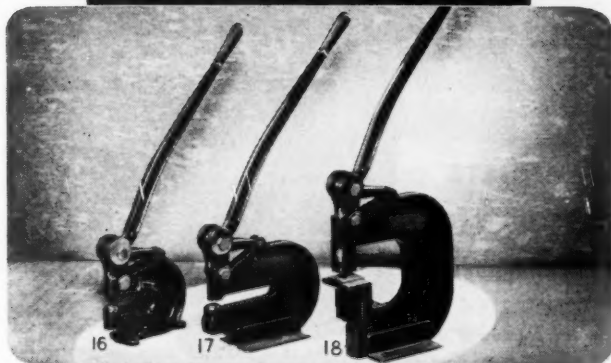
chine in five years instead of being compelled to wait twenty years to recover his investment. That is what the law does, and that is all the law does, the major points out.

He makes it clear that it does not guarantee anybody any profit of any kind; and that unless the income from the new machine is sufficient to cover the increased depreciation to which Joe is entitled, the certificate will do him no good whatever. That is a risk that

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WHITNEY METAL TOOL COMPANY

115 FORBES STREET, ROCKFORD, ILLINOIS

Joe must take. Moreover, the new law does not even guarantee Joe a market for his product; but as long as the emergency continues, of course, he can be reasonably confident of selling his expanded output, so he should come out all right.

The certificate of necessity, the major also emphasizes, has nothing whatever to do with the R.F.C. It does not entitle Joe to obtain a loan from the government or from anyone else; and yet it

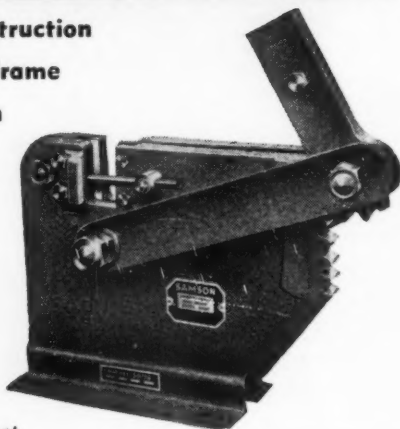
may help because—he says—"It's a lot easier to get a loan that you can repay in five years than it is to get one that you can't repay for twenty years."

And there—the major concludes—is the nub of the new law. It offers no financial incentive or reward to any business because—he explains—no patriotic American needs any special inducement when it comes to the defense of his country. What the law does do, he points out, is to make it financially

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possible for many vital industries to undertake, at once, a vast expansion program that they otherwise could not attempt, perhaps, for many, many years.

Joe has just one question. "What happens," he asks, "if—after a couple of years—the army doesn't need any more of these gadgets? How will I pay off my loan at the bank?"

"Joe," says the major, very slowly, "that's a tough one. The amortization law that Congress passed during the last war would have protected you especially against that contingency; but the new law doesn't. It's a risk you'll have to take, and one that a lot of other businessmen are taking in this emergency. But, Joe—I'm asking you to take it. We need those whatzits badly!"



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*This cross-section
tells it's own story
of how to save
money on
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MEYCO bushings combine the best features of steel and carbide . . . the protection of steel with the long life of carbide at the points of wear. First cost: higher; end result: substantial savings in production costs. Made to ASA standards . . . MEYCO bushings will **SAVE** you money. Don't miss *this* bet! Many sizes now available from stock.

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Making "whatzits" for the Army

Well, gentlemen, young Joe responds to that appeal as any other good American would. He borrows the money and expands his production. And here I am going to make two rather violent assumptions: first, that the government—in an excessively generous mood—permits him to write off the entire cost of his new machine in the five years; and second, that he buys the

machine itself at the same old price of \$2,000. In justification of the latter assumption, I can only suggest that perhaps he got it at wholesale, through a friend.

In any event, our enterprising new businessman now has two machines in his basement. He has bought and paid for both of them. His certificate entitles him to recover the cost of the new one in five years; but he still must spread out the cost of the old one

An advertisement for Morton Fixture Clamps and Components. The top left features the 'MORTON' logo in a black box. To its right, the words 'Fixture Clamps' are written in a large, elegant script, with 'AND COMPONENTS' in a smaller, bold, sans-serif font below them. The central part of the ad is a collage of various mechanical clamps and components, some shown in perspective and others as line drawings. A large, stylized script 'Be Sure..' is positioned to the right of the central collage. Below this, a block of text describes the company's 30 years of experience and the quality of their products. A small 'WRITE TODAY!' stamp is placed over the text. At the bottom, a black box contains the company name 'MORTON MACHINE WORKS' in white, bold, sans-serif letters. Below this box, the address '2422 WOLCOTT • DETROIT 20, MICH.' is printed in a bold, sans-serif font.

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MORTON MACHINE WORKS

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over the full twenty-year period. And so, at the end of another year, we find him preparing his tax return.

Each machine, he discovers, has yielded an "operating profit" of exactly \$2,000. On the new machine, therefore, he takes the \$400 depreciation which his certificate allows him; and this leaves a taxable income of \$1,600—\$800 tax for the government and \$800 profit for himself. On the old machine, however, he can take only the regular \$100

depreciation; so he pays his usual tax of \$950 and has a \$950 profit left.

And now, for the first time, he can see exactly what the new law has meant to him in actual terms of dollars and cents. His certificate is "saving" him \$150 a year in taxes on the new machine, but it is also "costing" him \$150 a year in profits. So he figures he's breaking even on the deal, and sends a check for \$1,750 to the tax collector.

And this time, the collector has no



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The
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5635 FILLMORE ST., CHICAGO 44, ILL.
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complaints about it, but apparently he is practically the only man in Washington who hasn't. The next morning Joe wakes up to find that instead of being a patriotic American citizen,

he has suddenly become public enemy number 1.

In the very same Congress that enacted the law, some of the members are now declaring that Joe is raiding the Federal treasury and robbing his

fellow taxpayers. They say that, at the end of five years, he will own his machine, free and clear, and that the government will have paid for it through tax concessions. Many of the most distinguished senators and representatives agree without question that the treasury is subsidizing Joe; and a member of the President's cabinet declares that it might be cheaper for the government to have bought the machine in the first place, and to have gone

Announcing **NEW CAM CLAMPS**

These cam-action clamps were designed for applications where parts (such as castings, larger forgings, or stacked stampings) having variable thickness, are to be held. They are the only big cam clamps known that provide convenient means for locating the spindle assembly along the toggle bar. The spindle itself is easily adjusted for clamping height, and can be replaced by a special pressure pad to suit other clamping requirements.

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Recommended force at end of toggle bar: 1200 lbs. Recommended force 3 1/4" from front of base, 1900 lbs.

MODEL CAS-1200

This clamp has the additional advantage of permitting the toggle bar to be swiveled around the base to any position within 180°

MODEL CAS-2000

This clamp has the same features as Model CAS-1200, but for 2000 lbs. clamping force.

MODEL CAV-2000—similar to above but has fixed base.

This entire series is also available without cam action (with fixed locking). Catalogued as Models V-1200, S-1200, V-2000, and S-2000. Complete catalog sent on request.

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directly into the business of making whatzits, on its own.

A certain labor leader, who is never slow to impugn the patriotism of his fellow Americans, declares, in a speech, that Joe is so disloyal that he refused to lift a finger to fight Communism until the government had guaranteed him a profit. And a member of Congress is so impressed by the speech that he has it printed in the Congressional Record at the taxpayers expense.

Newspapers report that two separate Congressional investigations of the affair are being started, and a columnist predicts that these investigations will unearth a scandal which will make that mink coat in the White House look like a dyed muskrat in the bargain basement.

Joe can hardly believe his eyes and ears. From his own actual operating experience, he knows that every one of those charges is untrue -except, per-



Countless users of open back inclinable presses can now have the advantages of Verson press design in economical units suitable for a wide variety of stamping jobs. Such features as the allsteel frame . . . machine cut steel gear and pinion . . . split cap main and crankpin bearings . . . mechanically interlocked type pneumatic friction clutch and brake unit . . . and many others are all incorporated into the Verson O.B.I. line. Six models, rated in maximum capacity at 90, 105, 125, 150, 210 and 250 tons respectively, are now available.

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haps, that one about getting the subsidy. He isn't quite sure about that; so he digs out a pencil and paper and starts to figure it for himself. It doesn't require calculus, or analytical geometry, or trigonometry, or even algebra. All it requires, Joe finds, is plain, old-fashioned, grammar school arithmetic.

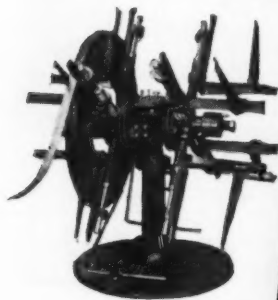
There are three major possibilities

that the emergency will last less than

five years; exactly five years; or more than five years. If it lasts less than five years, of course, he will be left saddled with a debt on his machine, as the major had explained, and no amount of figuring will help, so he passes on to the second possibility.

Here he finds that if the emergency lasts exactly five years, and if then there is no further market for the output of his new machine, his situation will be this:

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Vital minutes are saved, with practically no down time for coil replacement, when a Littell Double Reel uncoils stock to the punch press. The idle side of the reel is loaded while the other side pays out. When a coil is used up, the operator simply lifts the hub lock pin, then swivels the reel 180°, thus placing the reserve coil in press feeding position. The change-over is complete in a few seconds. Like Littell Single Reels, Littell Double Reels combine balance that means smooth running accuracy with rugged malleable iron and steel construction that assures year in, year out dependability.

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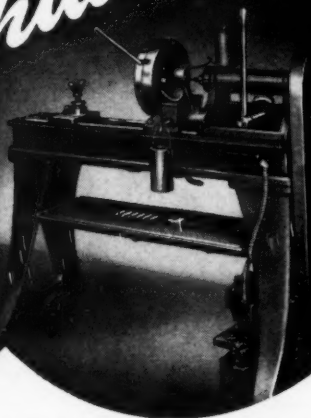
DISTRICT OFFICES: DETROIT, CLEVELAND

He will have recovered—out of his own earnings—the \$2,000 that he paid for the machine, and he will have settled his loan at the bank, in full over the while five-year period. He will have paid \$750 less in taxes than he will pay during the same interval on the old machine; but he likewise will have received \$750 less in profits. Clearly, therefore, the government has made no financial contribution whatever to Joe's business, and by no possi-

ble stretch of the imagination could the so-called tax "concession" of \$750 have paid for a machine which cost \$2,000. So Joe can only conclude that the official who argued that it would be cheaper for the government to have bought the machine in the first place was either very weak on arithmetic or very strong on government ownership.

Moreover, the machine itself is now worthless, so far as Joe is concerned. Mechanically, it will be good for

Whiton



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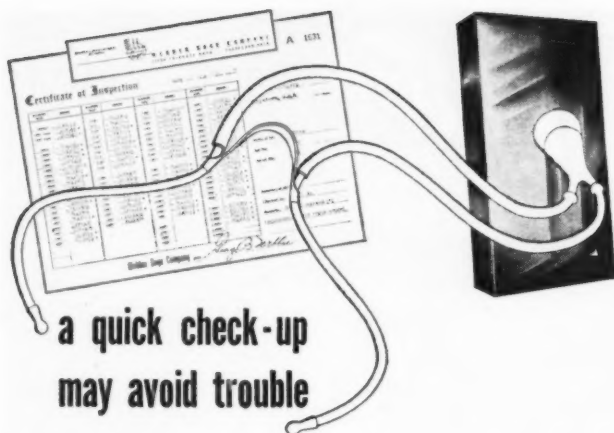
another fifteen years, but productively, its useful life is over.

Under any theory of taxation, of course, Joe would always have been entitled to recover the cost of that machine over the period of its useful life; so the certificate of necessity has given him no tax "concession" whatever. Yet without that certificate, he probably could not have bought his new machine at all. So here is what has happened:

As the direct result of that certifi-

cate, the army has received the defense materials which it needed so badly; one more worker has been given a job; the government has collected \$4,000 in taxes, which it would not otherwise have obtained; Joe has received \$4,000 in profits as the fruit of his enterprise. Moreover, he is now in a position to expand his production still further should some new emergency require it.

Next Joe comes to the third possibility—that the emergency does not end in



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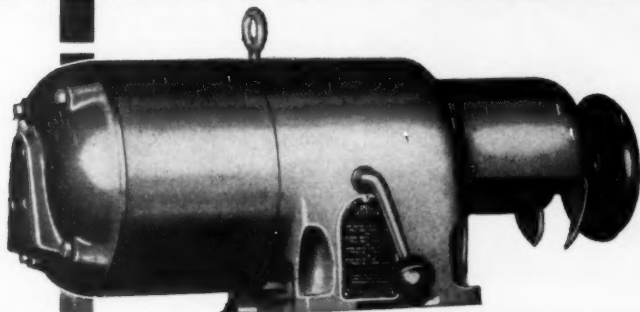
five years, and that he is able to go right on selling the entire output of his new machine for the whole twenty years of its life. Those extra fifteen years should be clear velvet for him, and that seems to be what his critics in Washington are most worried about. Yet a few simple calculations—had the critics taken the trouble to make them—would have put their minds completely at rest. Here is what Joe's figures show:

Since he will recover the entire cost

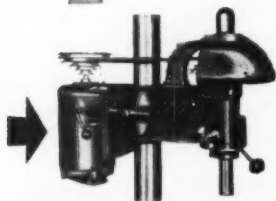
of his new machine in the first five years, he can take no further depreciation on it, thereafter. So in the sixth year, he finds that his "operating profit" of \$2,000 has become, automatically, his taxable income; and instead of paying the government a tax of \$800, as he formerly did on this machine, he must now pay a tax of \$1,000 a year on it. That is \$50 per year more than he is paying on his old machine; and he will have to pay this extra \$50 every year from now on.

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Thus, fifteen years hence, when his new machine is worn out, he will have paid the government a tax "bonus" of \$750, which will exactly wipe out the tax "saving" of \$750 which he enjoyed in the first five years.

Over the entire twenty years, he finds, he will have paid a total tax of \$19,000 on the output of the new machine—\$800 a year for the first five years, and \$1,000 a year for the next fifteen. On his old machine, over the same period, he will also have paid a total tax of precisely \$19,000—\$950 a year for twenty years. It all comes out exactly even, to the penny!

And so, Joe discovers a fact which apparently has not yet penetrated the minds of many of the most distinguished and well-informed members of Congress. And that fact is this:

It makes not the slightest difference whether the cost of the machine is written off in one year, three years, five years, or any other number of years. At the end of the useful life of that machine—whatever its useful life may be—the result will always be exactly the same as long as the tax rate applicable to the income from that machine remains the same. It makes no difference, either, how large or how small the profit may be, or how widely it may vary from year to year. In the end, the government will have collected the same amount—to the precise penny—that it would have collected under any other system of amortization or depreciation.

the certificate of necessity has proved meaningless

So once again, so far as Joe's fiscal operations are concerned, it will produce neither gain nor loss so for him as long as the tax rate applicable to his business remains unchanged. Should his tax rate go up over the twenty years, however, Joe finds that he will have lost money. He will have

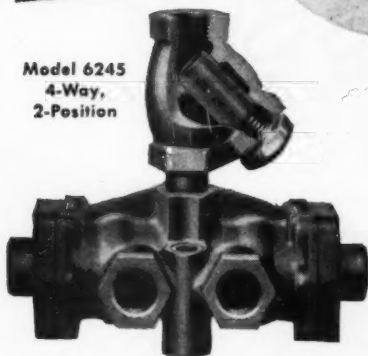
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By "complete" is meant that Allegheny Ludlum produces the full range of modern cutting tool materials, hence is in position to know and recommend the type best suited for any stated purpose. Unbiased content makes the 8 1/4" x 11" booklet, shown, all the more valuable. Specify its title, "Cutting Tool Materials."

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paid the government a larger tax than he would have paid had he not used the rapid amortization provision of the new law in the first place. Conversely, of course, if his tax rate declines over the next twenty years, he will have gained an actual tax saving.

In that respect, therefore, his certificate represents a gamble—but not a very good gamble from Joe's point of view.

He figures that any man who sees how taxes have risen in the past twenty years and who will then willingly gamble on a tax decline in the next twenty years is undoubtedly engaging in the most magnificent flight of optimism that this country has seen since the Republican campaign of 1948.

New law neither enriches nor subsidizes

An so, gentlemen, our now-highly-



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108 Foote Ave., Jamestown, N. Y.

educated Mr. Jones has demonstrated conclusively that the new law neither subsidizes nor enriches business at public expense; that it will expand, rather than diminish, the tax revenues of the Federal treasury; and that it has enabled American industry—at private expense—to enlarge its defense production to a maximum degree in a minimum of time.

Like all illustrations, the one I have just presented has been highly simplified. It has not taken account of the inflationary effects of rising wages, mounting costs and higher prices. It has ignored the recent tax boosts that have occurred. It will be noted too that Joe's profit represented a tremendously high return on his capital investment—more than three times as high, in fact, as the average which prevailed throughout industry last year. Yet, were all of these factors to be taken fully into account, they would not alter the basic lessons of this illustration in any particular.

Here we have seen the true and exact facts regarding this controversial law, and if there is any way whereby the committee of this chamber can bring an understanding of those facts to the American people, we shall, in my opinion, have performed a major service, not only to American industry, but to the entire national defense program as well.

For of this one thing I am convinced:

If this law is, in reality, the evil measure that its critics believe it to be, then it should be repealed without question; but if its critics are wrong, as the facts clearly prove them to be, then certainly, the businessman who avails himself of this law in the service of his country has a right to expect that he will not thus become an object of scorn and the victim of suspicion!

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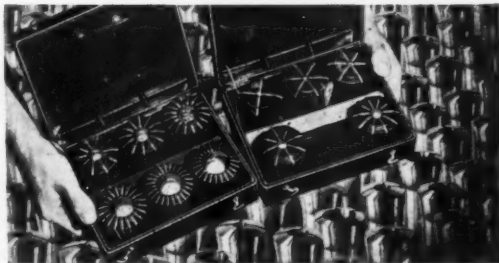


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Nose Lathe Chuck



Producing M-47 General Patton tanks at Baldwin-Lima-Hamilton

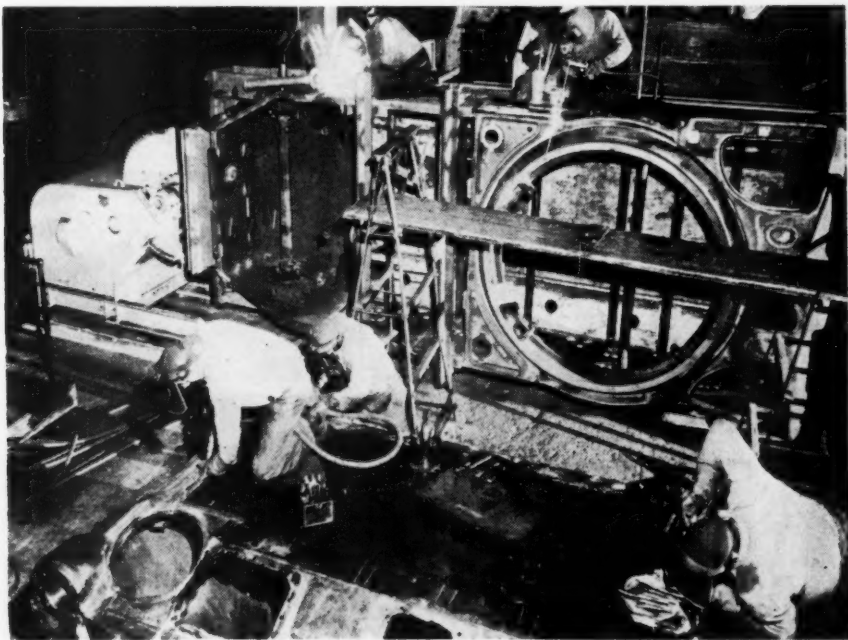
PRODUCTION of the new, redesigned any standardized M-47 General Patton army tanks is expected to be rapidly accelerated as B-L-H Corp., now ahead of schedule, brings tank hull production up to full scale.

A good measure of the magnitude of the job of fabricating the hulls is afforded by rough overall dimensions and weights. Tank hulls, when completed with inside fittings, weigh about 15 tons and include 800 lb. of weld metal. The principal welds join 20 heavy steel plate members and eight steel castings to form a hull approximately 20 ft. long.

All welding is done by the electric arc method, using AC transformer type welders of 500 ampere capacity. Welding electrodes are a special purpose shielded arc type for welding armor and range in size from 5/32 to 5/16 inch diameter. The number of welding positioners for the assembled hull will be increased from 10 to 30 by July 1. Figures 1 and 2 show a few of the welding operations.

After welding, the hull undergoes six separate machining operations. About 80 percent of the machining operations are done after assembly and welding. Principal operations before welding are

1. Assembly of M-47 General Patton army tank hulls . . . is entirely welding, done largely on motor driven positioners. Each hull requires 800 lbs. of weld metal deposited from welding rods more than a mile in length.

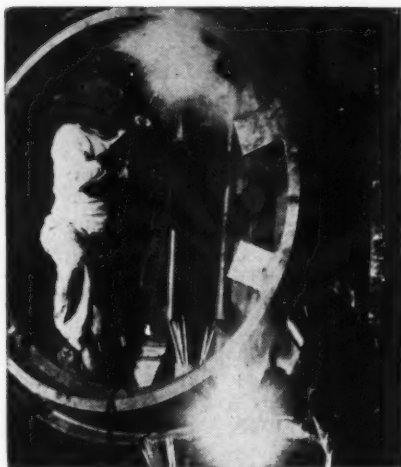


planing the edges of the plates for weld joints and drilling holes in the side plates. Many of the machine tools were formerly used for machining steam locomotive parts, and were rebuilt for the special operations required for tank fabrication.

The first machining operation is boring and facing the transmission openings and the idler shaft sockets. Four horizontal boring and milling machines are provided for this job. Second is the milling of bottom slope sheets for attachment of suspension brackets for wheels. Horizontal boring and milling machines are used for this purpose.

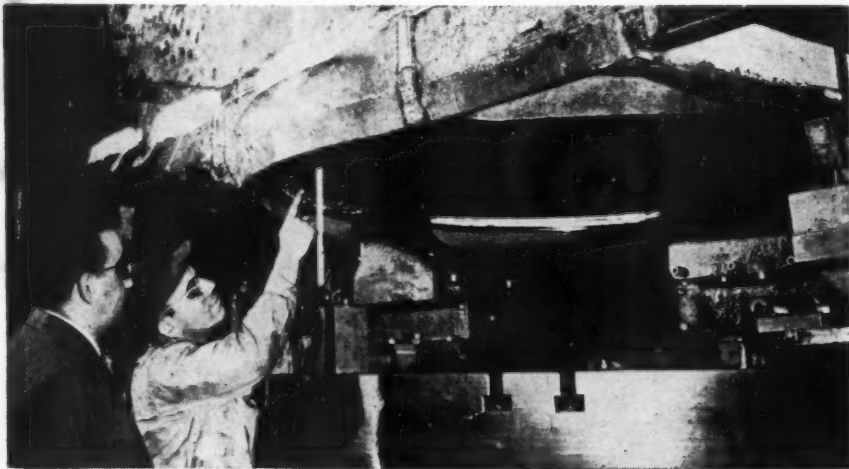
Next is the boring and facing of the turret foundation ring, shown in figure 3. This is of exceptional interest because it is done by means of an 84-inch vertical boring mill. Since the hull is far too large to be rotated on the table, the columns and cross rails were removed and the cutting tools are mounted on the table. The hull is turned upside down for these operations and is held stationary over the table. Three of these converted machines will be ready for use by July.

3. Tank hulls are too large . . . to be rotated on the tables of 84-inch vertical boring mills. Consequently the hull is turned upside down above the table and the cutting tools are rotated on the stationary hull.



2. Welding the tank turret . . . in preparation for fitting it into the hull.

The fourth operation employs the largest machine in the shop, a multitude



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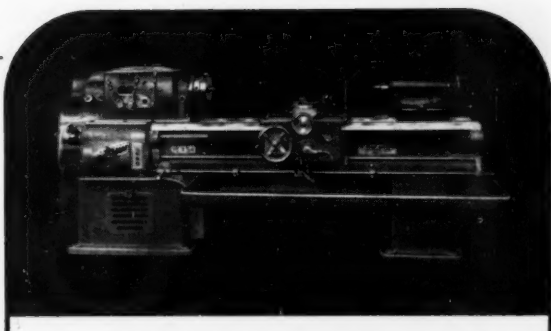


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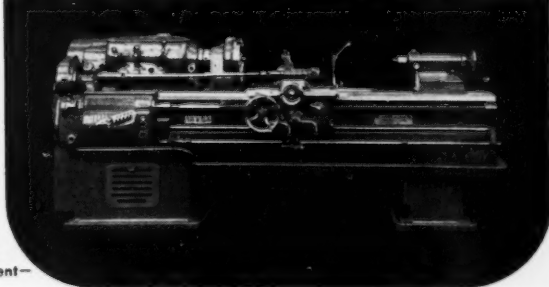
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4. One of the four heads of a multiple head drilling machine, . . . the largest machine in the tank hull fabricating shop, drilling a slope sheet for bolts for suspension brackets.

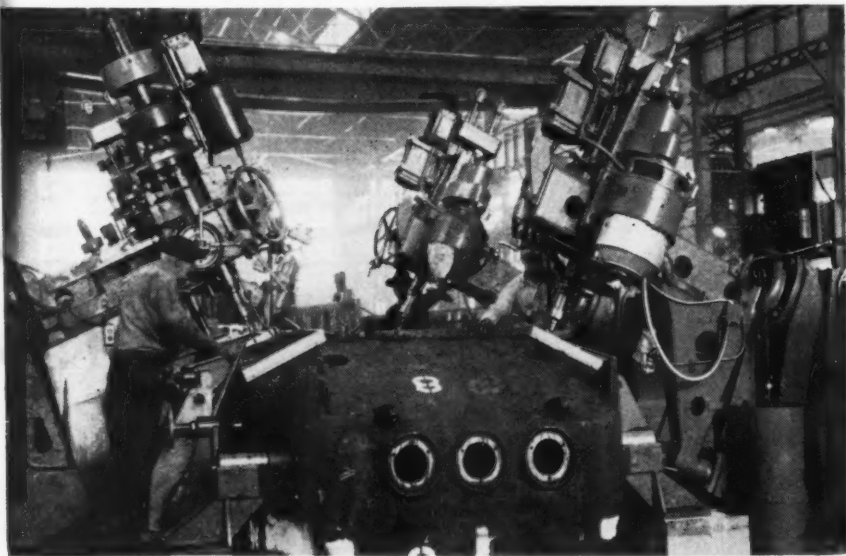
head drilling machine, which is shown in figures 4 and 5. In this machine, which was also specially reconstructed for the job, the slope sheets are drilled for bolts for suspension brackets.

The hull then goes to a radial drill for the drilling of turret foundation rings. The final machining operation is drilling and tapping for the idler sprocket bearings with horizontal drills.

One of the most interesting features of all machining operations is the use of four fixed reference points for positioning the hull. For this purpose dowels are placed in the rough machined openings for the idler sprocket axle and the final drive housing. All machine set-ups are also fixed with reference to centerline points on these dowels.

After the tank hulls are machined they are loaded in pairs on flat cars for shipment to the Detroit Arsenal. (Photographs through courtesy of Philadelphia Evening Bulletin.)

5. Slope sheets on the tank hull are drilled . . . for suspension bracket bolt holes by a multiple head drilling machine, the largest in the fabricating shop. The hull is shown held in position by dowels in openings for the idler sprocket axle and final drive housing.



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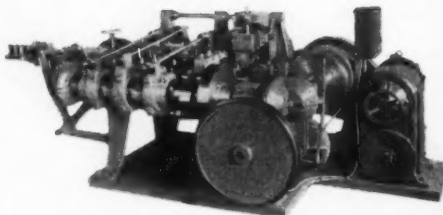
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1. **Hydraulic Speed Mill** provides fast, accurate milling of small parts through automatic table cycling and group-operation. Cycles from 10 seconds to 18 minutes. Descriptive folder available from **Viking Industries, Rockford, Ill.**

2. **Precision Holding Tools** catalog "J" includes sections on precision collet chucks, adjustable and full floating holders, precision tap chucks, air-operated speed chucks, and air cylinders, precision expanding mandrels, speed indexers, and boring and reaming tools. **Erickson Tools, Div. of The Erickson Steel Co., 2315 Hamilton Ave., Cleveland 14, O.**

3. **Standard Production Tools**, such as recessing tools, and work rest blades are described and illustrated in bulletins Nos. 10-50 and 11-50 respectively. Specifications and prices are given. **Scully-Jones & Co., 1907 So. Rockwell St., Chicago 8, Ill.**

4. **New Valve Catalog**, containing 44 pages, illustrates and describes hundreds of standard models and modifications, including straightway, three-way, four-way and four-way five port units in various sizes of hand, foot, solenoid, pilot, etc. A non-technical explanation of air valve operation is also given. **Ross Operating Valve Co., 120 E. Golden Gate, Detroit 3, Mich.**

5. **Loma Saw** features hydraulic feed and clamp, swinging saw arm, saw-blade which rotates clockwise, and pressure gauges. Four-page folder is available from **Loma Machine Mfg. Co., Inc., 580 5th Ave., New York 19, N. Y.**

6. **Milling Cutters and Tracers** enables the stock to be removed quickly and accurately, leaving smooth finishes. Some of the items described in a 16-page catalog are spiral fluted Keller cutters, taper Keller cutters, Hi-Helix end mills, taper tracer points, and cylindrical tracer points. **Pratt & Whitney Div., Niles-Bement-Pond Co., W. Hartford 1, Conn.**

7. **Baker Industrial and Laboratory Furnaces**, including the baby furnace, tool room gas furnace, bright annealing and brazing furnace, and others, are illustrated and discussed in 11-page booklet published by **Baker & Co., Inc., 850 Passaic Ave., E. Newark, N. J.**

8. **20-KW Induction Heater**, for use in high-speed annealing, brazing, hardening, and soldering, features a nonventilated, dustproof, NEMA type 12 enclosure. It can be used for long- or short-run production and is available with or without variable power adjustment. Ask for 4-page brochure **GEA-5594. General Electric Co. Schenectady 5, N. Y.**



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9. Miniature Ball Bearings 12-page catalog 51b contains complete specifications on more than 70 different types and sizes of ball bearings as well as typical applications and photographs of various installations. **Miniature Precision Bearings, Inc., Keene, N. H.**

10. Properties and Working of Stainless Croloy Tubes and Pipe handbook describes tubing steel and deals with methods of manufacture and inspection, corrosion and oxidation, and methods of working and fabrication. Data on physical and mechanical prop-

erties and processing of different types of stainless Croloys is also given. 104-page bulletin 1B available from **The Babcock & Wilcox Tube Co., Beaver Falls, Pa.**

11. Totrust and Totalume, rust inhibitive coatings, stops rust at its source and can be applied over damp or dry, rusted or new metals. Descriptive folder available from **The Wilbur & Williams Co., Boston 15, Mass.**

12. General Drivmatic, a drill-riveting machine, drills, countersinks, feeds and heads a rivet, which operations can be

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performed in a continuous automatic cycle. Four-page bulletin available from **General Riveters, Inc., 785 Hertel Ave., Buffalo 7, N. Y.**

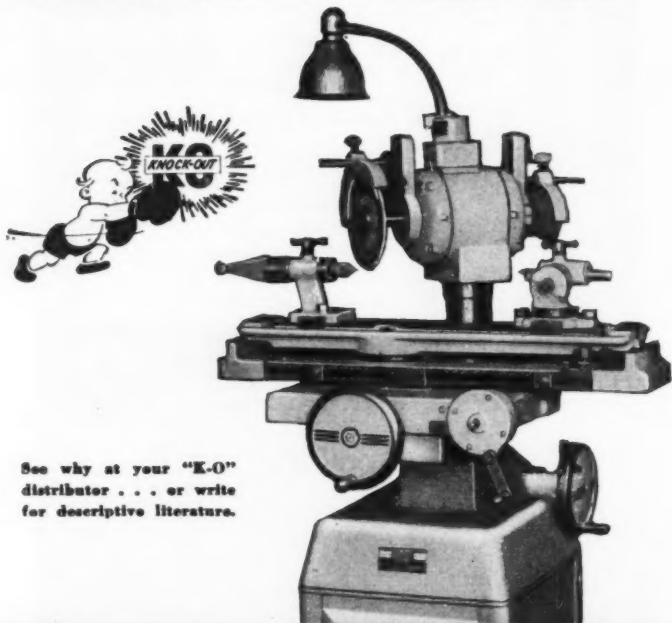
13. Standard Metal Cutting Tools stock list and price list provides information on quantities for immediate delivery. New milling cutters in accordance with A.S.A. Standard B5.3-1950, spur gear shaper cutters, both 20° p.a. and 14½° p.a., are listed for the first time. Catalog available from **Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.**

14. Cutting-Off Machines, full auto-

matic, lathe type, will cut any material that can be turned. Features square lathe cut, one second index time, removable chip pan, quick easy set-up, etc. Twelve-page bulletin available from **Modern Machine Tool Co., Jackson, Mich.**

15. Will-Cool Oil Cooler can cool cutting oil and lubricating or hydraulic oil at the same time. Its advantages are uniform work pieces, longer tool life, less tool grinding, reduction of oil evaporation, etc. Eight-page bulletin describes this cooler and also shows typ-

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ical application. **B. S. Williams Co., Inc.**,
6 North St., Mt. Vernon 1, N. Y.

16. "The Facts about Clean Oil", 16-
page booklet, gives information on oil
purification for hydraulic equipment,
metal-working machines, gas and Diesel
engines, turbines, transformers, etc.
Shows correct method and equipment
to stop downtime, cut down rejects, im-
prove and increase plant production.
Honan-Crane Corp., 911 6th St., Leban-
on, Ind.

17. Maxitorq Clutches case history book
shows original equipment installations
of an ore loader, can seaming machine,
packaging equipment, power sweeper,
industrial truck, machine tools, etc.
Also includes information on the new
Maxitorq automatic overload release
clutch designed for protection of high
speed machinery. **The Carlyle Johnson
Machine Co.**, 52 Main St., Manchester,
Conn.

18. Hassall Catalog No. 60, 34 pages,

3 HI-SPEED AUTOMATIC PRESSES

5 TON

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BRAKE
RELEASE

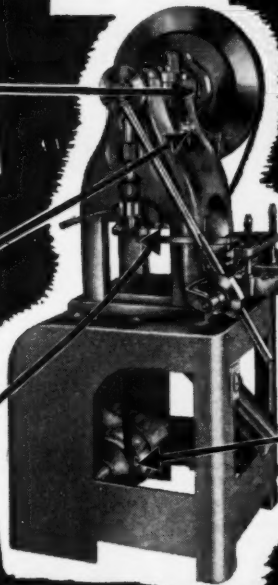
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explains the savings in operations and materials costs of cold headed fasteners. Illustrates the variety of nails, rivets, screws and other specialties available through the cold heading method. **John Hassall, Inc., Clay and Oakland Sts., Brooklyn 22, N. Y.**

19. Visual Grind, grinding machine with continuous inspection, features precision optical system with selected matched lenses; control functions, conveniently accessible; one-shot Bijur lubrication system; etc. Four-page folder

available from **The Cleveland Grinding Machine Co., 6514 St. Clair Ave., Cleveland 3, O.**

20. 2-Speed Transmissions, used to supplement constant-speed and multi-speed motors with the advantage of providing broader speed ranges and special ratios, are described in a 2-page catalog. Another 2-page catalog includes engineering dimensions and specifications of the "420" transmission. **Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich.**

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21. Corrosion-Resistant Fittings are described in 8-page Speedline Fittings Book which also shows how light-walled Schedule 5S corrosion-resistant piping reduces the cost of a typical piping layout. **Horace T. Potts Co., Erie Ave. and D St., Phila. 34, Pa.**

22. Stonhard Stonpach at a thickness of ½" will overcome problems of excessive water conditions, oils, greases, and acids. It is easily applied, requiring only water to mix; ideal for breweries, dairies, laundries, food processing

plants. **Stonhard Co., 500 Stonhard Bldg., Dept. MTBB, 1306 Spring Garden St., Phila. 23, Pa.**

23. 1951 Safety Booklet, 11 pages, includes recommendations covering the amount of torque or "wrench pull" to use when mounting wheels on cylindrical grinding machines. Available from **Grinding Wheel Institute, Green-dale, Mass.**

24. Boring and Facing Machine performs various cutting operations eliminating the conventional overhang due

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Table travel, 20"

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to necessary bar travel in reaching the work piece. Its unusual mounting of the spindle housing provides for greater rigidity in facing, boring, and milling. Ask for 15-page bulletin 103. **Forney's Inc., New Castle, Pa.**

25. Coolant Spout, adjustable to any position at a touch of the hand, provides elimination of leaky pipe joints and swivels, unrestricted flow of coolant, clear, unobstructed view of the work, etc. Two-page catalog available

from **J. N. Fauver Co., Inc., 49 W. Hancock, Detroit 1, Mich.**

26. Defense Production Bulletin SC-150, 8 pages, covers heating for forging and heat treatments to develop the required properties for the production of ordnance material. The items covered are ammunition, guns, tanks, aircraft and ships, production of engines, power transmission equipment, and tools and special parts. **Surface Combustion Corp., Toledo 1, O.**

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27. Rotary Straighteners, 11 models remove the bends, bows, waves and kinks from tubing or pipe of any metal and handle tubing in all sizes down to 1/8" O.D., and pipe up to 15" in diameter. Ask for 4-page catalog No. 7265. **Mackintosh-Hemphill Co.**, 901 Bingham St., Pittsburgh 3, Pa.

28. Chain-O-Flex Conveyors consists of link chain moving in steel tubes. Drive unit can be furnished with single speed or a three to one infinite variable speed adjustment. 16-page booklet illustrates and describes these conveyors. **Chain-O-Flex Corp.**, Franklin Park, Ill.

29. Utility Press, multi-purpose machine, combines the valuable features of screw, ram and power presses all in

one. Uses, such as "shearing-in" punches and dies, separating punch and die holders on larger liner pin die sets, and assembling and aligning punches and dies, are explained in bulletin available from **The Producto Machine Co.**, 960 Housatonic Ave., Bridgeport 1, Conn.

30. Life-Line, SK D-C motors and generators, pre-lubricated and steel protected, are available for constant, adjustable or varying speed applications for continuous or intermittent service. 27-page booklet B-4594 discusses these motors and shows, in enlarged scale, the significant features of design. **Westinghouse Electric Corp.**, Motor and Control Div., Buffalo, N. Y.

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NEW BOOKS

Metal processing

By Orlan William Boston. Published by John Wiley & Sons, Inc., New York. Second edition, 1951. 763 pages, \$7.50.

This completely revised edition provides the reader with detailed information on machine processes, accessories

and tools, and the correlation between design, metals, and manufacturing of a product. The chapter on die casting and plastics has been removed making it possible to add a chapter on surface quality and enlarge the chapters on machinability, machine tool drives, covering electric motors, and hydraulic pumps, both with their controls and circuits.

This volume contains all the information needed for the complete preparation of routings including the selec-

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tion of machine tools, the cutting tool materials, tool shapes, power, speeds, and feeds, and all accessories involved in the plant layout and manufacture.

Professor Boston, because of his many years of teaching, research, and consulting experience in the field of metal processing, is well qualified to write this volume. This book is recommended as a textbook for colleges, but will also serve as an excellent source of material for industrial or short courses dealing with machine tools, cutting tools, and

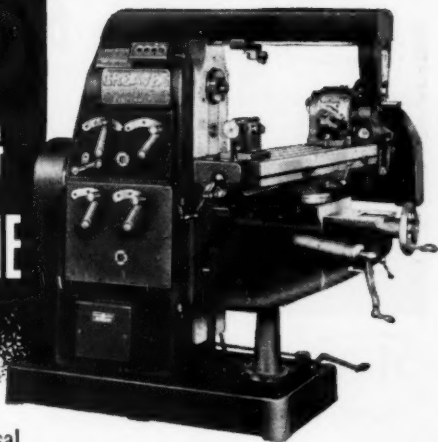
machinability. Because of its practical elements, it should prove beneficial to production, tool, and design engineers, superintendents, foremen, and draftsmen.

The machine tool primer

Written and published by Herbert D. Hall Foundation, Newark, N.J. 1948. 324 pages.

The primary purpose of this primer is to impart, simply and briefly, an explanation of what the metalworking in-

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dusty is all about. Not only is it directed to the beginner, but to the adult as well who may wish to gain an understanding of machine tools and their uses, and with what other metalworking machinery they are associated.

It contains many elements of vocational guidance in that it defines the work done on various machine tools, the levels of skills and intelligence required for jobs in machine shops, and tells about shop careers.

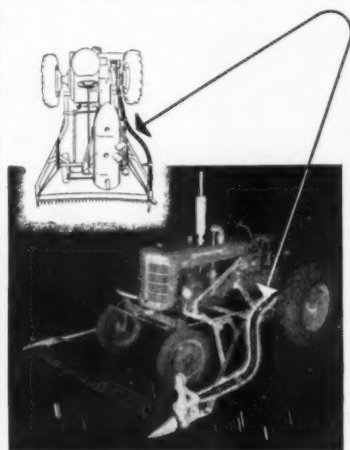
This volume is divided into three

parts: what machine tools are used for, what machine tools are, and factory safety.

New lessons in arc welding

Written and published by The Lincoln Electric Co., Cleveland, Ohio. 1950, 312 pages. \$1.00.

Certain fundamental facts of welding, which will enable the welder to use the welding process successfully and economically, are presented in this



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any
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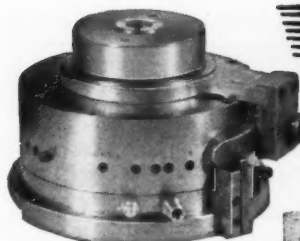
handbook. This book is an enlargement, by the addition of new material, of a series of lessons which forms the basis of instruction in The Lincoln Arc Welding School.

Some of the lessons contained herein are: the "shield-arc", "fleetwelder", "Lincwelder", striking an arc, weaving, polarity and arc blow, lap welds in flat position, welding on "fleetweld 7, 9, 11, 37, 47", electrodes, welding copper with carbon arc, hard surfacing with "hardweld 100" electrodes, etc.

Fundamentals in the production and design of castings

By Clarence T. Marek. Published by John Wiley & Sons, Inc., New York. 1951, 383 pages, \$4.00.

Stressing the importance of correlating casting design with the economical manufacture of castings, this book presents an analysis of the techniques, skills and practices of casting production. The author also discusses jobbing shop molding, the theory of clay bond,



RC-5



INDEX CHUCK

with Air Operated Collet

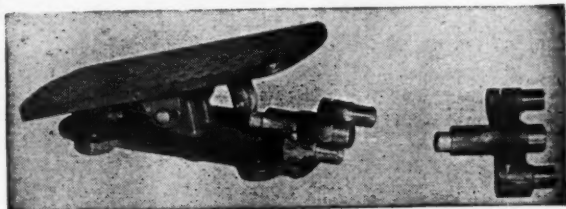
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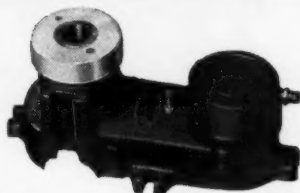


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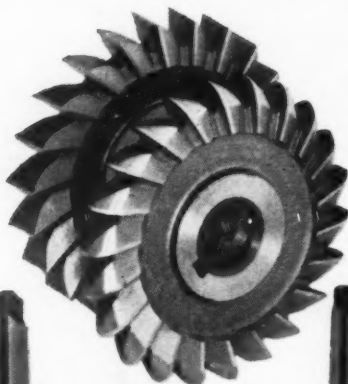


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patterns and cores, and new methods of high-voltage x-ray and supersonic inspection. Up-to-date information is given on the properties and uses of ferrous and non-ferrous metals and the melting of cast metals.

At the present, Mr. Marek is associate professor of manufacturing processes at Purdue University, having served as chairman of the Metals Casting Conference sponsored by Purdue and the American Foundrymen's Society during 1948-49.

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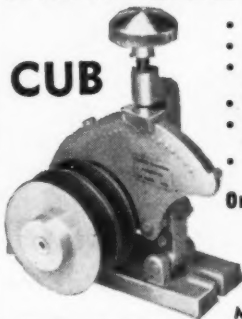


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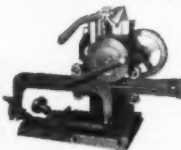
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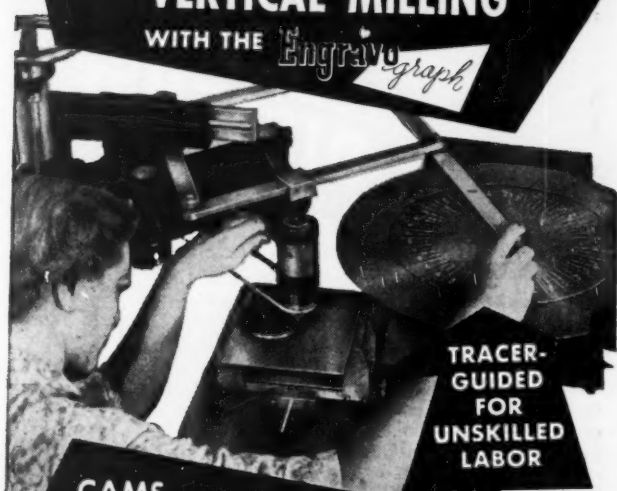
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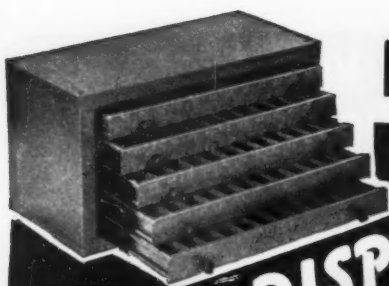
Machinability and machining of metals

By Norman E. Woldman and Robert C. Gibbons. Published by McGraw-Hill Book Co., Inc., New York. 1951. 518 pages, \$7.50.

This is an up-to-date analysis of the metallurgical and machining characteristics of today's metals and their alloys. Methods for selecting the proper

material and processing it to give the easiest and most satisfactory machining into the finished product are discussed. Various groups of metals are treated separately, such as low-carbon steels, high-carbon steels, stainless steels, magnesium, nickel, and others.

Suggestions are made as to tool design, cutting speeds, feeds, and type of cutting fluid which will produce the best results. The author goes on to point out where common practice and



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INDEX**

standard design tools may be used and indicates where the use of special practices or tools is desired.

An important feature is the coverage of new developments such as theoretical considerations of machinability, including the mathematical derivations; machining of the light metals such as aluminum and magnesium; machining the hard, high temperature alloys and the refractory metals molybdenum, tungsten, etc. A special section is de-

voted to non-metallic materials including plastics and hard rubber.

Dr. Woldman, a consulting metallurgical engineer with more than 30 years' experience, has been associated with the Bendix Aviation Corp. and Westinghouse Corp. Mr. Gibbons, also a metallurgical engineer with 16 years' experience in metallurgical aspects of fabrication methods, is associated with the Eclipse-Pioneer Div. of Bendix Aviation Corp.

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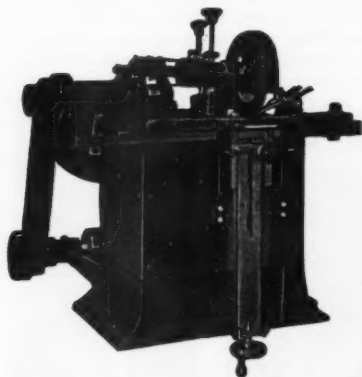
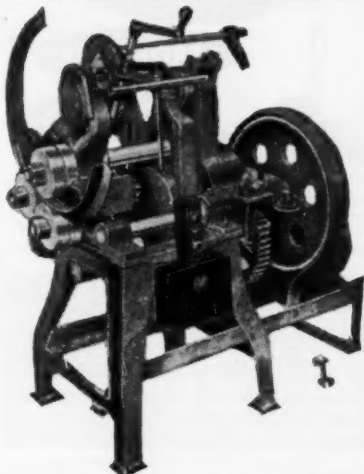
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Improves sharpness of new blades . . . cuts more metal in resharpening

New hack saw blades are usually not ground after hardening. That is why blades resharpened on Wardwell EC Grinder are better than new.

Ordinary blades are junked after two or three sharpenings. Because of its precision EC resharpens them at least six times and thus returns its cost on blade purchases alone. Write for Bulletin EC. Wardwell Mfg. Co., 3165 Fulton Road, Cleveland 9, Ohio.



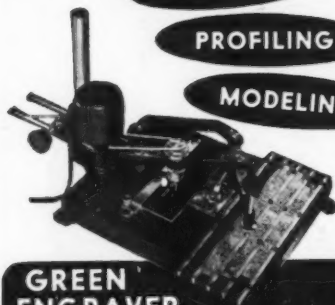
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GREEN INSTRUMENT COMPANY
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News of the Industry

New Britain Firm announces new officers

The announcement of important changes and promotions among the officers of The New Britain Machine Company was made recently by Chairman Herbert H. Pease following the annual meeting of the board of directors.

Herbert H. Pease will retire as president, continue as chairman of the board. Robert T. Frisbie, who has been first vice president, was elected president. Ralph S. Howe, who has been vice president, was elected executive vice president. Julian C. Pease, who has been secretary, was elected a vice president, and also a director of the company. William J. Lofgren, who was treasurer, was elected secretary and treasurer.

W. B. Bainton and P. R. Hatch were elected vice-presidents of the Brown & Sharpe Mfg. Co. at a special meeting of the Board of Directors held recently at Providence, R. I. Both men have been in their present positions since 1947, Mr. Bainton as Works Manager and Mr. Hatch as Sales Director.



P. R. Hatch



W. B. Bainton

T.G. Barnes has been appointed production manager of the Firth Sterling Steel & Carbide Corporation McKeesport Pa.

Four officers of The Warner & Swasey Company were appointed to new posts at a recent directors' meeting. **C. W. Bliss**, formerly the controller of the company, was elected treasurer; **Irving C. Bolton**, formerly treasurer, was elected financial vice president; **E. B. Gausby**, formerly assistant treasurer, was elected secretary; and **Warner Seely**, formerly secretary, was elected vice president.



E. B. Gausby



C. W. Bliss

W. P. Nolan has been appointed chief engineer of the Firth Sterling Steel & Carbide Corporation, McKeesport, Pa. He began his association with Firth Sterling in 1941 as electrical engineer, and following that he served as superintendent of construction and maintenance until his present appointment.



W. P. Nolan

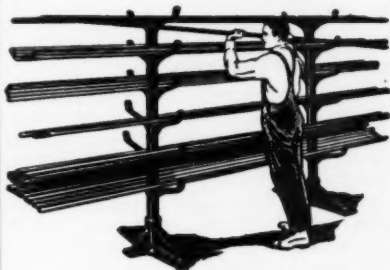


O. Wendell Macy

O. Wendell Macy has been appointed sales manager of Hydraulic Power Division, The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, according to a recent announcement made by John M. Dolan, vice president and general sales manager.

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The **BROWN TIME-SAVING RACK** saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

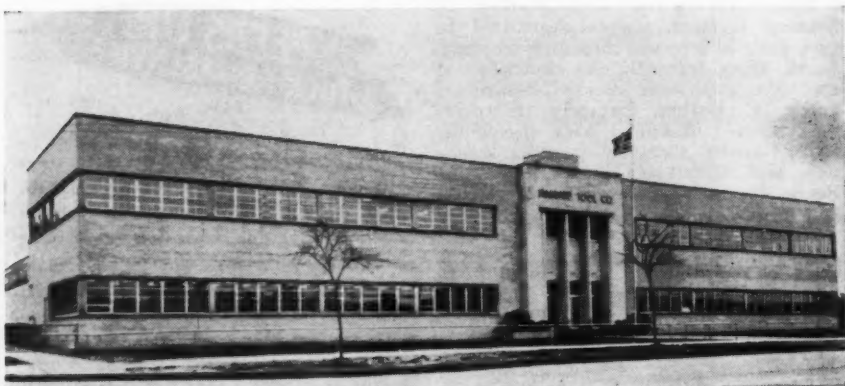
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BROWN'S QUICK-SERVE RACKS

BROWN ENGINEERING CO.

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RACKS • VISES • CLUTCHES • COUPLINGS



Standard Tool Co. . . . inaugurates its new headquarters building in Cleveland; the building will be used as executive offices, warehouse and experimental laboratory by the company.

Standard Tool Company opens new headquarters

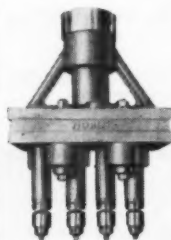
Standard Tool Co., Cleveland, Ohio, manufacturers of cutting tools, moved into its new office, warehouse, and experimental laboratory at 40th St. and Chester Ave., on Tuesday, April 3rd.

The building was formally opened with an open-house reception for 300 industrialists and visiting mill supply and hardware distributors.

Standard Tool has 130 employees in Cleveland and 54 in its branch offices in New York, Chicago, Detroit, and San Francisco. The company employs 1,800 at its main plant in Rochester, Mich. Paul E. Lees and Philip Rackliffe serve as president and executive vice president, respectively, of the Cleveland firm.



At opening of Standard Tool Co.'s new plant are . . . Henry J. Smith, district representative for Machine and Tool Blue Book, with Dale R. Greenwood of Bay State Abrasives and Lew Fykse, vice president in charge of engineering of Standard Tool Co.

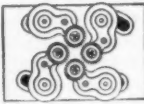
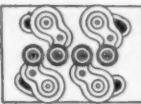


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Nu-Matic Grinders, Inc. moved from Detroit, Michigan to 8224 Carnegie Ave., Cleveland 3, Ohio. The concern is being managed by **Arthur Raske**, executive vice president. Newly appointed, Mr. Raske was formerly District Sales Manager of The Brush Development Company, Cleveland.

Appointment of **Willis H. Kuhlman** to the newly-created post of supervisor of Monarch Mena-Matic lathe sales for the Monarch Machine Tool Company, Sidney, Ohio, is announced by Stanley A. Brandenburg, sales vice president.

Henry D. Sharpe, Jr. was chosen president of the Brown & Sharpe Mfg. Co., succeeding his father who was elected Chairman of the Board at a recent meeting of the Board of Directors at Providence, R.I.



Henry D. Sharpe, Jr. Henry D. Sharpe, Sr.

William J. Woods has been named director of purchasing for Mackintosh-Hemphill Co., Pittsburgh, Pa., according to R. G. Neilson, manager of manufacturing operations.

Sailor E. Beer, associated with the Monarch Machine Tool Company, Sidney, Ohio, in a variety of special sales capacities for the past six years, has been named distributor sales manager for the company, it has been announced by Stanley A. Brandenburg, Monarch sales vice president.

J. C. L. Brown has been appointed sales manager, machinery division of the Gardner Machine Company, Beloit, Wisconsin, manufacturers of disc grinders and abrasives.



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J. K. Smit & Sons, Inc., Murray Hill, N.J., manufacturers of industrial diamond products, announce the election of **Pieter Smit** as president. Until recently secretary-treasurer, Smit is the third generation of his family to take an active interest in the leadership of the company. Mr. Johan J. Smit, Sr., continues as chairman of the board.

The Diamond Machine Tool Co., Los Angeles manufacturer of precision metal working machinery has just appointed **Gene Heller** to direct the sales and advertising of the company.

Ralph O. Anderson, Norton Company district manager in St. Louis, Mo., has been appointed by the National Production Authority to serve in its Machinery Division as abrasive consultant. Announcement was made recently by **Ralph M. Johnson**, Norton Company vice president in charge of sales.

John H. Daum has joined the Harrington-Wilson-Brown Company, New York City machine tool distributors, as a general partner and sales manager.

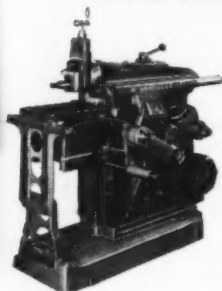
Robert T. Eakin, metallurgical engineer who joined Allegheny Ludlum Steel Corporation as a student trainee in 1940, has been appointed manager of the company's largest plant, at Brackenridge, Pa., succeeding **George Evans** who becomes special consultant to the vice president in charge of operations.

Mark W. Cresap, Jr., management consultant, has joined Westinghouse Electric Corporation, Pittsburgh, Pa., as a vice president and assistant to President Gwilym A. Price. The announcement of Mr. Cresap's election as a vice-president was made by Mr. Price following a recent Board of Directors' meeting.

The election of **Edwin B. McConville** as executive vice president of Skilsaw, Inc., Chicago manufacturers of portable power tools, was announced by **Bolton Sullivan**, company president, who also reported the election of **Paul Watts** as vice president in charge of sales and **Ralph B. Brundrett** as treasurer of the company.

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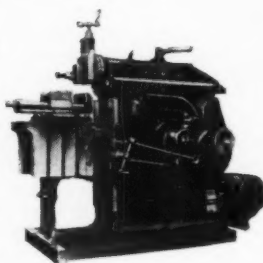
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8 Speeds, R.P.M., 12-132.

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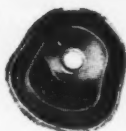
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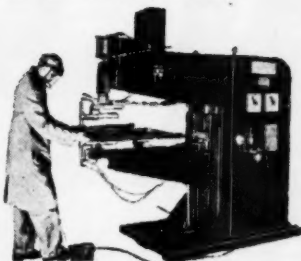


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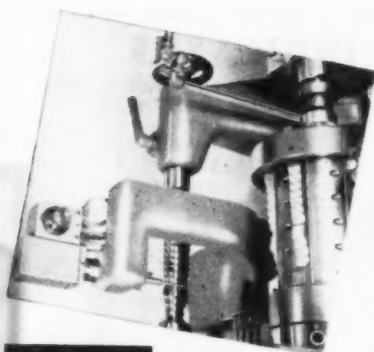
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MTBB

FOREMAN

Foremen are key to making production planning productive

By Edmund Mottershead

THE OTHER DAY a friend of mine was telling me a story. He said that a few weeks before he had obtained a position with one of the large plants here in Chicago in the production planning department. When he went home the first night and told his family about it, his twelve year old son had asked: "What's productive planning, Pop?"

He said he thought for a moment that the youngster had made a mistake, and then realized that the question really had a deeper significance, as the chance remark of a child so often does. And he said to me: "What was I to tell the kid? What does stock control or cost accounting or time study mean to anyone his age? I had a difficult time making the whole idea of production planning clear to him, and when I got through I wasn't at all satisfied with my own understanding of it."

I wonder how many foremen have more than a hazy notion of just what

production planning really is. And if they have some understanding of it, what are they doing to make it truly productive planning?

Planning in its broadest sense

pertains to the formulation of a program for the entire organization to follow. It begins with the plans of the board of directors, and follows down to the smallest group of workers. It considers the finances of the present and future, the functions of selling, design, accounting, the layout of the plant, departments and equipment, the routing or pathway for materials to follow in their flow through the plant, the scheduling of the time jobs are to be started and completed, the following-up or dispatching of the work from step to step, the directing of individual production, and the anticipation and meeting of the labor and material needs. There is one great requirement of the individual who is to carry out this function of planning . . . VISION.



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Shank and
Arbor
Types

• Woodruff Key Seat Cutters by Reltool are furnished in both Shank and Arbor Types. Right Hand Cut, shank type, carried in stock; Left Hand Cut, special. Arbor Type Keyseat Cutters have staggered teeth, with side teeth relieved for narrow margin.

• Reltool Dovetail Cutters, Shank Type, are designed to take the place of arbor type and threaded hole angle cutters . . . for use in Reltool End Mill Holders.

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The ability to plan productively demands vision . . . the ability to see ahead, to imagine, to anticipate contingencies and prepare for them. There are perhaps only two qualities which make one man a worker and another man a leader: the ability to handle other men, and the ability to think and plan. Thus for the foreman who seeks further advancement, an understanding of production planning is essential. For the foreman who sincerely thinks and wants to make his department as efficient a part of the plant as possible, an understanding of the production planning of his particular organization is essential. And for the foreman who WILL advance, the ability to plan productively is a primary qualification.

Eight factors of production planning

There are eight factors with which production planning is basically concerned: what is to be made; why it is to be done; how many or how much is to be produced; when it must be done; who is to do it; where or in what department or on what machines; how or by what method it is to be done; and how much it shall cost. The term "production planning" thus refers particularly to the actual processes of production in the organization and involves both planning and control of those activities.

"Productive planning" simply means that planning along any and all of the eight lines mentioned above must be quick and accurate, must make the most effective and efficient use of whatever factors are at hand, so that cost budgets and production schedules may not only be met but bettered.

In the typical small plant, the superintendent and a clerk may take care of the systematic outlining and control of the flow of work. In larger organizations, this work is carried out by a planning department, a methods engi-

neering department, an engineering department, or some such . . . the function is basically the same, whatever the actual name given the group or department.

In most plants, this function includes a combination of both planning and control. It lays out the most effective pathway for work to follow in the factory, figures out ways and means for accomplishing that journey and goes with it as its guide to see that it keeps on its proper and appointed path and gets to the journey's end in good shape and on time. Such planning determines where, when and how work shall be produced. The planning may be a very simple process, or it may be the more elaborate systems found in large organizations. The best system is one which is not so simple that it is inadequate, and yet not so complex that it is burdensome . . . one which requires the smallest amount of forms and detail work to get out the best and most economical results.

Functions of the planning task

Some of the more detailed functions of the typical production planning task would include: advice as to the design of the product, perhaps even determining that design; providing the necessary patterns and manufacturing tools; determining the kinds and amounts of raw materials, machines, tools, and equipment to be purchased and installed; discovering and developing methods for doing the work itself with the tools and labor at hand; routing and scheduling the work as it goes through the shop; setting the standards of quality and quantity; using whatever cost accounting or time study or other special skills as will expedite the work and turn out the finished goods on schedule or ahead of schedule, up to standard quality or better, and at the predetermined cost or less. Stock room control, supervising and maintaining

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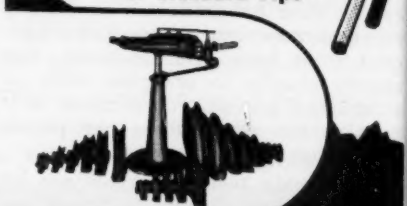
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equipment, keeping and interpreting production control records of all kinds, outlining labor requirements, selecting methods of transportation, developing the safety program which will aid the production effort, and keeping the plant layout in tune with the production requirements are other functions of the planning operation.

Planning is essentially a matter of analysis. Whether the plant is large or small, no planning worthy of the name can be done for production or for any other purpose until the problems incident to it have been analyzed. This applies equally to the plant with an established planning department as it does to the plant where one person carries out all the functions.

My friend's twelve-year old son hit the nail on the head . . . **production planning must be productive planning.** A general good standard to use as a guiding principle is to so plan that all employees, machines, and equipment, as well as material and supplies are profitably employed. This means that there must be a careful study of the capacities of men and machines, a thorough knowledge of the tools and other equipment, a detailed separation of each

job into its components through job analysis, both for production and for worker-training purposes.

Job analysis, an exacting study of each job, is a vital part of production planning, and may even be considered the outstanding factor in the work. Routing, scheduling and dispatching all depend upon it. Of course, the nature of the goods produced and the size of the plant have a great influence upon the type and scope of planning. A plant may be of the continuous type, manufacturing a standard product, of the continuous type turning out a diverse list of products, or of the assembly type making either a single product or diverse products. Each situation demands a different approach.

As commonly encountered, the simplest form of production planning is that where the plant is manufacturing a standard product of fairly simple design. Here the superintendent merely gives a bill of materials of specifications to the foreman and then confines his planning to a personal oversight to the processes to see that the right job is done first and that subsequent operations follow in correct sequence. If a rush order is to be given precedence

GRIND THESE ANSWERS OUT IN A HURRY

by Professor Herman Reichardt, Consulting Engineer

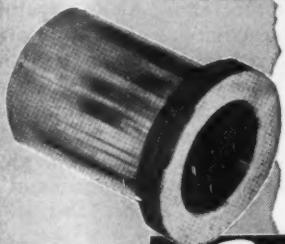
Count ten for each question answered correctly. 80-100, your grinding is on the beam; 60-70, wheel a little worn, but good; 50 . . . well; below 50, dress the wheel down and take another cut at it.

1. High Tensile strength materials require an **aluminous** or **vitrified** wheel?
2. The larger the wheel the **harder** or **softer** the wheel should be?
3. Oily coolants require **harder** or **softer** grades of wheels?
4. The slower the wheel speeds the **harder** or **softer** the grade should be?
5. Cold wheels will break more readily than warm wheels at **high speed** or **forcing work**?
6. In offhand grinding the tool is **held intact on side of wheel** or **kept moving across face of wheel**?
7. A thin edged tool generates **more** or **less** heat than the thick edged tool?
8. The heavier tool leaves **more** or **less** chatter marks?
9. The **flat** or **cup** wheel should be used on the wider lands?
10. When tool or cutter grinding, use speeds of **2,500-4,500** or **4,500-6,000**.

Answers to quiz on page 351.



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over other orders, he gives this order his personal attention and puts pressure on the various processes to insure its speedy completion. This of course eventually leads to having the bulk of the orders in process labelled "rush," a situation all too familiar to many of us.

A more advanced form of production planning in the small shop occurs where production is controlled through a production department under the control of the superintendent. This department creates a master schedule of production upon which there is based a manufacturing order system. This schedule lists the orders and dates on which they are to be completed. The component parts of the order are issued in such a way that the whole thing will be completed on the specified date. Periodic reports are required of the foreman and shortages and delays investigated and corrected where possible.

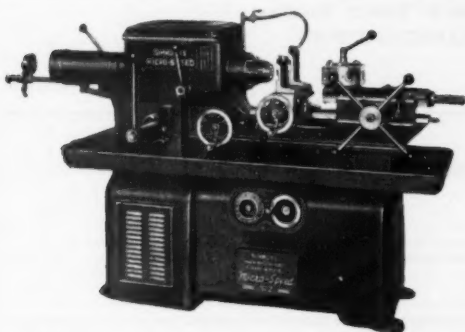
A still higher form of production planning is one where the department has direct control of certain functions bearing directly upon the effectiveness of the production departments, such as the operation of toolrooms, shop transportation and maintenance of equipment, the requisitioning of workers to be hired by the personnel department and similar over-all functions not within the responsibility of a single department. By exercising such control, the planning department is in a better position to integrate the workings of all departments and thus achieve a closer adherence to the general production schedule.

Production planning report

As an aid to foremen in helping them become better planners, the American Institute of Human Relations, in its



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foreman training program, used a "Production Planning Report," a generalized and schematic report form, which is reproduced on the following pages:

This report form accomplishes several things:

1. It focuses the minds of foremen and supervisors upon the factors of production with which they have to deal;
2. It focuses their attention upon the **productiveness** of their planning, in terms of what was scheduled and what actually happened;
3. It aids in developing cost consciousness;
4. It brings home the importance of control and follow-through;
5. It makes them continually aware of the purpose of their department, and their purposes as foremen, supervisors, etc.
6. It gives them an opportunity to relate and analyze the instances of par-

ticular difficulty they have encountered;

7. It gives them a chance to make suggestions for better methods, layout, etc.; both for their own department and for others;
8. It gives top management . . . if the reports are used systematically over a period of time . . . a good over-all view of what is going on and which supervisors are on their toes;
9. It gives top management a simple written reminder of various needs as indicated in the suggestion sections;
10. It highspots any weak points in the whole production program.

The five sections are numbered at the side for ease in discussion and handling. Section (1) aims the report at the period and department being studied, and points up the functions and duties of the foreman in charge as he sees them. Section (2) puts down quotas of "hope"

**American Institute of Human Relations
PRODUCTION PLANNING REPORT**

Front

(1)	Date:	Name	Department:		
	Duties:				
	This report covers period from _____ to: _____				
(2)	PRODUCTION, SCHEDULED:		PRODUCTION RESULTS:		
	What items?		What items:		
	How many?		How many?		
	When due?		When due?		
	Where...machines, men, etc?		Where done?		
	How...methods to be used?		How...methods used?		
(3)	COST ITEMS:	BUDGET	EXPENDED	SURPLUS	DEFICIT
	LABOR	\$	\$	\$	\$
	MATERIALS				
	SUPPLIES				
	TOOLS				
	MACHINES				
	MAINTENANCE				
	MISCELLANEOUS				
	TOTALS				
	COMMENT:				

Reverse

(4)	OCCASIONS OF DIFFICULTY:	
	WHAT TROUBLE?	
	WHERE?	
	WHEN?	
	CAUSED BY?	
	HOW REMEDIED?	
COMMENT:		
(5)	SUGGESTIONS FOR YOUR DEPARTMENT:	SUGGESTIONS TO OTHER DEPARTMENTS:

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and actual results as a measure of success in both planning and production. Section (3) lists the cost of various factors and constitutes a recapitulation of these elements for comparison and also indicates relative efficiency of the foreman in handling the various factors of production. Section (4) gives the foremen a chance to alibi themselves and also to plan how certain troubles may be avoided in the future. Section (5) gives them a chance to make known their gripes and suggestions in a factual, impersonal manner.

The report forms are used in two ways: first, in the foreman training program, as a training device; second, by the plant as a systematic check-up and planning coordinator, modified in detail to their own needs. After the foremen have been coached in planning production, they are taught the use of the form or its particular local modification. Thereafter, Section (2), Production Scheduled, and Section (3) Budget, can be filled out in the front office at the start of a given period and the balance of the report filled in by the foremen at the end of the period. This gives the men their goals at the start of the period and lets them compare results at the end. A week or at the most two weeks is the usual period covered.

Such a form is particularly handy where the plant is operating without a separate planning department, although it has equally great value for foremen in larger organizations which do have such a department.

Whatever the size of the plant, whatever the complexity of its operations, the same basic problems exist; the same decisions must be made; someone must assume the responsibilities. Someone must do the thinking. And thinking for production planning must have vision, must have resourcefulness, must be fast and accurate. It must be productive.

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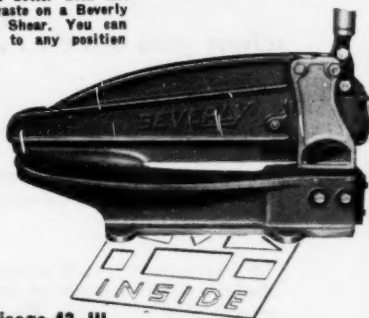
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Four steps in maintaining better quality

by Ralph E. Bryan

A GREAT many workers misunderstand the use of the term "quality" and think that the emphasis is on "good" or "better" quality. Actually, quality as it is normally considered is the sum total or pre-determined characteristics which fit a product to a specific user's need. Non-bearing or non-exposed surfaces, for example, may or may not require finishing, paint, or other treatment depending upon the product's final use. Finish may be more important to the user than durability. Size, weight, compactness, handiness, and a host of other "user's standards" go to making up the final specifications of the product.

Once the design and engineering departments have created the product to fit these needs, however, the problem of maintaining that predetermined standard falls on the shoulders of the shop foremen and supervisors. What are some of the results from supervisory failure in this respect?

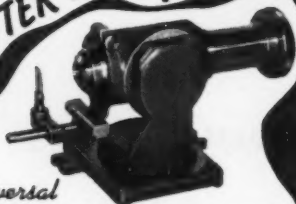
In the first place, lost sales, if inferior work is shipped out from the plant. J. Q. Public finds out very rapidly about a product which is not up to the competitive standards in performance and usefulness of similar products on the market in the same price range. Decreased volume of sales means less work in the shop and may lead to eventual layoffs, or at least to the discharge of the less competent and less necessary workers.

The bad reputation the product gets on the market also means that potential sales are lost. Your sales and advertising departments already have troubles enough in the present buyers' market, combating rumors about hidden weaknesses in your products, without there actually being any. Customers who resent imperfect merchandise sufficiently will not demand replacements, but will tell their friends and neighbors about your lack of quality. If replacements become necessary, your

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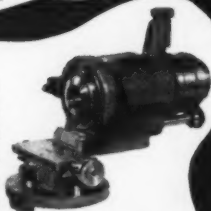
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CUTTER GRINDING FIXTURE fits any universal tool or surface grinder. The basic unit, shown here (standard accessories not shown), with its four attachments, below, provide a quick and accurate answer to nearly all cutter and tool grinding demands.



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service department will run its legs off trying to keep the customer happy when he should have been satisfied in the first place with a satisfactory product.

People, of course, never like to have rejects come back to them, and this natural reluctance to admit their own mistakes makes for buck passing in the organization all up and down the line. Enough buck passing will go a long way towards disrupting the whole works.

Generally, too, neglecting to maintain quality standards is a reflection of poor shop discipline all around. Shop morale is lowered. The workers fail to take pride in their work. This feeling of indifference about the whole thing soon shows up in other elements as well as that of maintaining quality. Along with this soon comes higher accident frequency, resulting in costs to the company for compensation, medical care, legal expense, lost time of employees, as well as the cost to the injured man in health, earning power, wages, and security.

One step in enforcing quality standards in your department is that of making these facts clear to the workers so that they realize the high cost of inferior quality, and the extreme necessity of your enforcing the standards set for each job. Once they understand its importance to them, they will cooperate.

Some of the major factors which affect the quality of any product include the basic design, competitive prices, accuracy of specifications, available workers, machinery and equipment, management pressure, and materials available. Methods of quality control range from piece-by-piece inspection of each article manufactured to statistical sampling methods.

However, in considering the technical aspects of quality control, the human element is frequently lost sight

of. Most of the devices for control have aimed at reducing the loss of human error to a minimum, but they do not reduce the actual error very much. The supervisor's handling of his men, enlisting their enthusiastic efforts, seeing to it that they use the right tools, right methods, perform according to standards, are the primary factors in reducing the errors of the human element.

The supervisor's responsibility for maintaining quality begins with his own thorough understanding of the standards set. The exact elements which are included in these standards become the quality "key points" in each job under his jurisdiction.

His next task is to see to it that all workers are specifically trained not only in their jobs but in those elements of quality which he understands to be essential in turning out this particular product.

His next task is to enthuse them in

the performance of their jobs in this specific way, giving them a sense of the importance of their part in turning out the product, showing them the usefulness of the product itself, and showing them how they benefit themselves in the whole effort.

Finally he has a task of continual follow-up to see if things are going as they should be, to re-sell individuals on the need for adhering to quality standards, to correct mistakes, retrain people who have apparently not mastered the key points of the task, and to maintain that spirit of loyalty and enthusiasm in the group which will make for success in the group task.

To support their supervisors in this effort, one company, which manufactures closures for metal drums, makes extensive use of its employee magazine to explain how the quality control and inspection departments function, the importance of good closures



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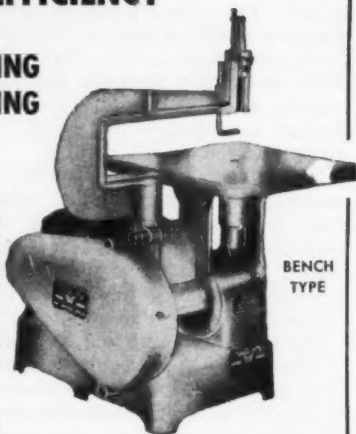
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for drums used to contain various liquids ranging from soft drinks to gasoline, and the importance of the various tasks in the plant in producing the high quality product for which the organization is known. Pictures of individuals doing various tasks the "right way" and the "quality way" illustrate these stories. This, of course, cannot do the whole job of selling quality to the workers, but it backgrounds the efforts of the supervisors as they deal with the problems of specific individuals in their own departments. It also provides an opportunity to give individual workers recognition for doing good work as a side-light on the general educational effort in the magazine.

Actually, supervisors must get cooperation from three areas in the organization in order to carry out their full responsibility in maintaining quality of production: from management,

from other supervisors and foremen, and from their own workers.

Cooperation with top management in maintaining quality involves making some contribution in some cases to the design of the product itself. Many times the foreman has definite job knowledge which will contribute to good product design and make it easier to maintain quality. Even after the product is in production, the supervisor frequently has valuable suggestions as to slight changes in specifications or modifications of standards which may improve the product's customer acceptance and at the same time level out the quality of work produced and make inspection burdens lighter.

In addition, the supervisor is management's best source of information as to what is going on in the production departments. Management must be kept informed as to materials, methods, tools, equipment, and all other factors in-

volved, as they affect the ultimate quality of the product. Shoddy materials may creep in past people doing materials receiving and storing. Equipment may prove to be inadequate for certain tasks. Scheduling of parts may hamper the maintenance of proper quality. The flow of work may create stockpiling of materials in the aisles and around workplaces in such a manner as to put undue pressure on workers and cause hazards. These, and a host of other pertinent facts, must be kept before the attention of management so that management may coordinate the entire production effort and maintain the quality it wishes to have built into the product.

Cooperation with other department heads and supervisors is also a two-way necessity in maintaining quality. The engineering department needs suggestions, and also must be informed as to the completeness and accuracy of blueprints, the workability of inspec-

tion devices and similar matters. The chief storekeeper needs information as to parts and materials requirements, and should understand the storage and handling problems of each department. Through maintaining friendly relationships with other supervisors and department heads, getting thoroughly familiar with their departments and departmental needs and problems, and at the same time making them understand your own department's problems, the way is smoothed for inter-departmental cooperation throughout the plant.

Having trained the workers in their jobs and having maintained enthusiasm, built up friendly relations, hoping for the best is not enough. A constant alertness for failures is necessary. Sometimes workers have individual quirks which make it difficult for them to perform consistently up to standard. A man may be left handed in the wrong place; he may lack a finger or two; he may be accident-prone; his eyesight



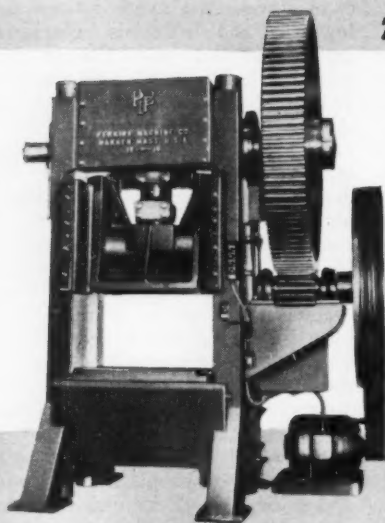
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may be insufficient; he may be too big and clumsy to handle a certain task. Sometimes a "retraining" of the worker is necessary and effective. Usually, however, it is sufficient to correct him tactfully, explain his mistake, demonstrate the correct procedure, and encourage him to do better.

When correcting workers, bear in mind that it should be done, when possible, privately, so that the man is not embarrassed in front of others. Try to put the man at ease by making it clear that you are not angry at him, but that you are concerned primarily with the mistake, with the work itself, and that you want to help him help himself. To err is certainly human, and we must deal with human nature as we find it, hence inspectors and inspection departments.

The effectiveness of the average foreman is usually measured by 3 very important and definite standards—his

contribution to improving the quality of the product, to reducing the cost of the product, and the ability he exhibits in maintaining manufacturing schedules in his department. Any activity on the part of the foreman which does not result in the attainment of one of these ends, either directly or indirectly, must be counted as time and effort misdirected and lost.

Control of quality involves the establishment and maintenance of suitable standards of material and workmanship as they appear in the finished product. Obviously, manufacturing operations can succeed only so long as they produce a saleable article, one which is consistently acceptable to the public.

While many factors go to make up the saleability of a product, most of them can be lumped together and called "consumer value" or the value of the product from the consumer's or

user's point of view. This value may be one of direct usefulness, or workmanship over and above that required for normal use, of time, or of place. The same goods delivered a month late may have little or no value compared to what it would have had if delivered on time.

Today most manufactured articles are sold in competition with similar products; therefore the consumer's choice is made as a result of comparisons of values (excluding for the moment the power of sales promotion and advertising methods). A comparison of values insofar as the typical customer is concerned involves the consideration of 2 principal factors: quality and cost. Obviously, the manufacturer who can produce and sell an article of equivalent or superior quality at the same or a lower price than competitive products will command the market . . . and keep his plant running full blast and his workers continuously employed.

In the final analysis, the customer controls the quality of a product by his decisions to buy or not to buy. When it has been determined what the customer expects or insists upon in quality, then the manufacturing departments must translate those demands into standards of production and see that those standards are maintained.

In today's buyers' market, when organizations are increasing their sales

staff, adding to their advertising budgets, and putting a huge effort behind the sale of their products, the supervisor and foreman in a manufacturing department have an intensified responsibility to give the sales force the kind of product they can sell most readily, one which has a reasonable price, and above all, one which has a reliable and consistent quality built into it through the cooperative efforts of every member of the manufacturing organization.

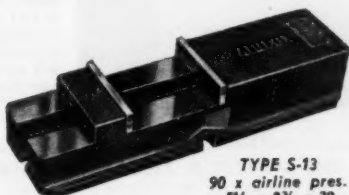
The End.



"I wondered why he kept teasing me for that old cab."

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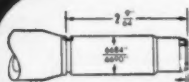
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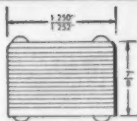


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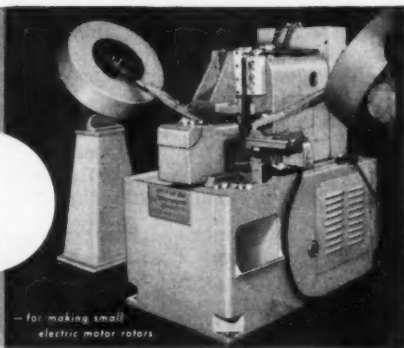


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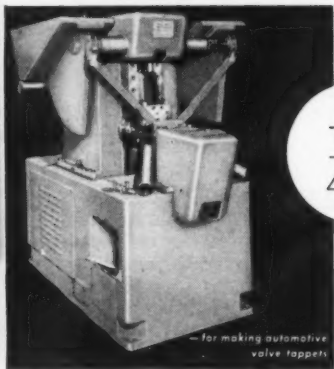
Operation: Turn O. D. and chamfer one end.

Material: Laminated silicon steel.

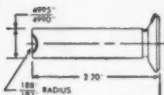
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A tapping fixture of welded construction

by Robert Mawson

WHEN special machining tools, jigs, fixtures and the like, are made of cast iron the procedure of making them is as follows: the tools are designed, the drawings or prints are sent to the shop where wooden patterns are made to suit the designs. These patterns are forwarded to the foundry where the necessary castings are made. These castings are then sent to the tool room where the tools are built.

From this outline it can easily be realized that there is not only lost time in making the several transfers but also possible delays waiting for the

patterns or castings. To avoid these delays, and also to reduce machining costs the modern plant is now building these special manufacturing tools by the welded construction method. This procedure enables the tools to be built in one department, the tool room. The tool room foreman is thus able to schedule his work to meet production requirements in the manufacturing department.

In figure 1 is shown a transfer remote control shaft, upper bracket, made of a die casting, which is one of the details used on the automobiles manufactured

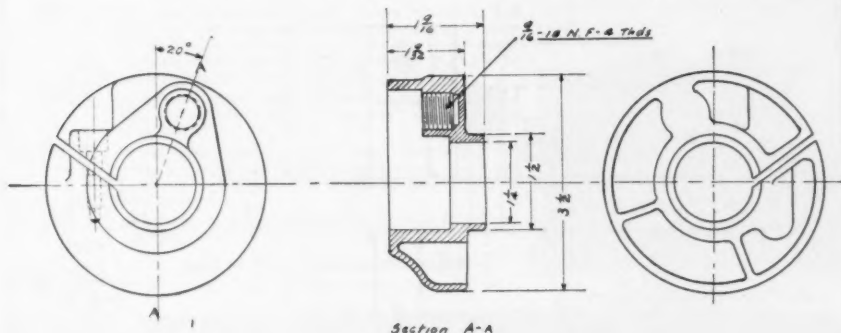


Fig 1

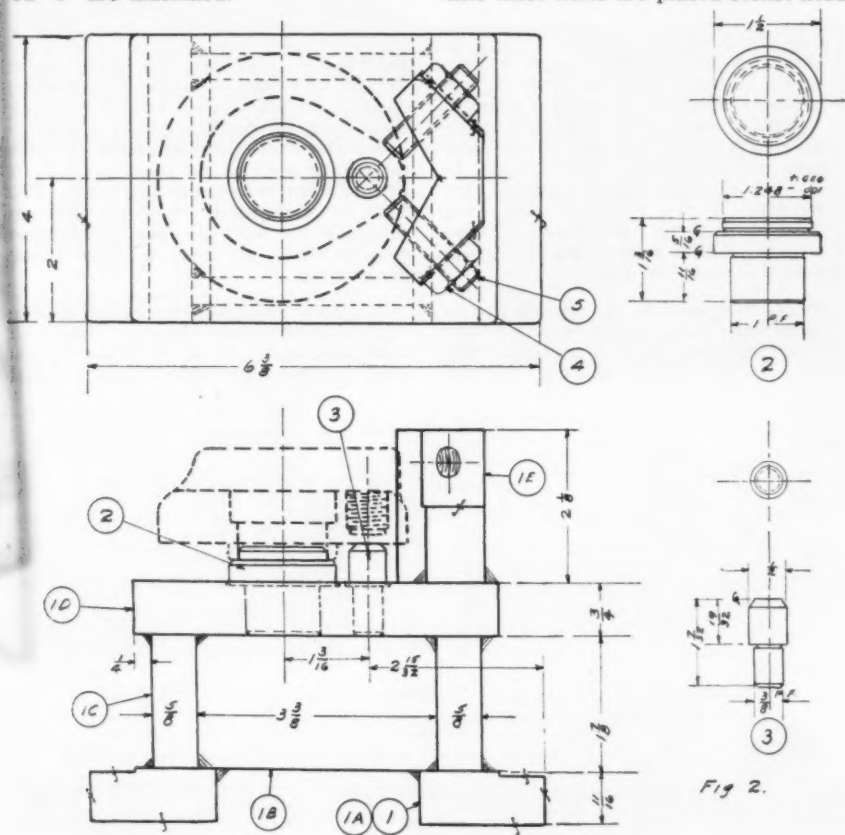
Robert Mawson

by Studebaker. The last machining operation when producing this part is to tap the $\frac{1}{8}$ -18 thread in the small boss. To obtain the advantages already noted the fixture used for this tapping operation was made by the welded construction method, figure 2.

When building this fixture the following machine steel sections are first cut: two $\frac{3}{4} \times 1\frac{1}{4} \times 4$ (1A), two $\frac{3}{4} \times 2 \times 3\frac{1}{2}$ (1B), two $\frac{5}{8} \times 2 \times 4$ (1C), one $\frac{3}{4} \times 4 \times 5\frac{1}{4}$ (1D), one $1\frac{1}{4} \times 2\frac{1}{4} \times 3\frac{1}{2}$ (1E). On each section $\frac{1}{8}$ inch is allowed on the length for finish. The several sections are then welded to form the fixture base (1). After the base has been welded to the proper form the several surfaces marked "F" are machined.

In the upper plate (1D) is next drilled and then reamed a one inch hole in which is placed the machine steel, carbonized, hardened and ground, locating plug (2). It will be noticed that the smaller projected portion of the plug is ground to be a good sliding fit in the $1\frac{1}{4}$ inch hole in the work-piece. Also in the upper plate is reamed a $\frac{3}{8}$ inch hole into which is driven the tool steel, hardened, rest pin (3). The top surface of this pin is accurately ground for height so that the work-piece will rest horizontally in the fixture.

In the angular steel section (1E) are drilled and tapped two $\frac{3}{8}$ -16 holes. Into these holes are placed socket head



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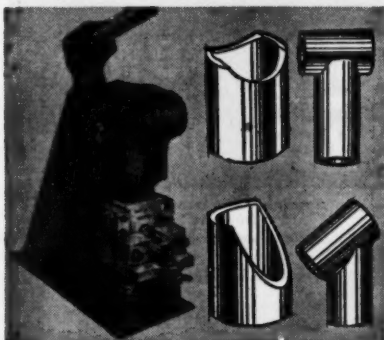
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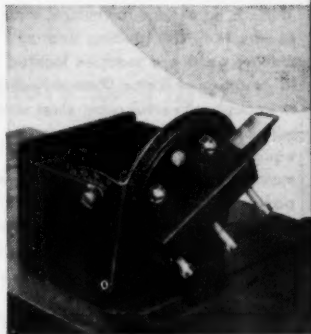
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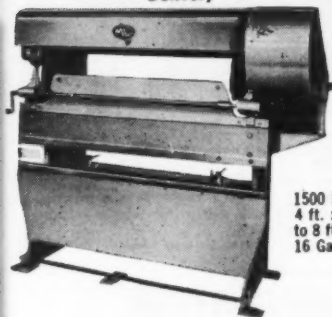
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cap screws (5) and on the outer end of each screw are screwed steel hexagon lock nuts (4).

To perform the tapping operation, the fixture is first held on the table of a vertical drill press and a tap of the correct size fastened in the machine spindle in the conventional manner. When setting up the fixture for the first time the set screws (5) are adjusted and then fastened with the nuts (4) so that the workpiece is in the correct position for tapping the hole. However, this setting up is only necessary when the fixture is made and is usually the job of the tool maker.

One of the pieces can now be placed in the fixture being located by the plug (2) and the two set screws (5). The machine is then started in motion and by feeding the tap down the proper distance the required hole is tapped. To remove the finish tapped workpiece it is only necessary to raise the machine spindle, and therefore the tap, and the piece can be lifted out of the fixture.

This tool locates the workpiece accurately and has a minimum of lost or unproductive time. It is a good example of a simple tool made by the welded construction method, stronger than a cast iron tool of similar sizes, it was built without waiting for a pattern or casting. Further, this modern method can be used both in the small jobbing shop or large plant with equal advantages.

How to prevent a bolt from breaking

Figure 1 shows a bolt that broke at the root of the last thread, as shown. It broke because it was not sufficiently elastic. And it broke at the root of the thread because that was the weakest point in the bolt.

Figure 2 shows how the fault was remedied—by threading the entire length of the bolt. By threading the entire length the total stretch does not concentrate on a single thread as was the case in figure 1. In figure 2 the stretch is distributed over the roots of all the threads. As a result the bolt is



FIG. 1

much more elastic and tougher and less apt to break.

Another method is to turn down the shank of the bolt between the threaded ends making the unthreaded portion smaller in diameter. It is a good method, but, many mechanics do not possess lathes whereas they do possess threading tools for doing the job as shown in Figure 2.

What is the horse power of that belt drive

For a close approximation of horse power transmitted by any belt drive—flat or V-belt—find the simultaneous total tension on the tight side, on the slack side, and the belt speed.

Press a light idler pulley against the mid-point of the belt until it deflects any convenient distance D. Measure the

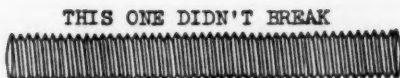


FIG. 2

force F in pounds required to produce the deflection D in inches. Measure the distance L between points of tangency on the pulleys as shown in the sketch, also in inches. For approximate computations this distance L can often be assumed to be the distance between shaft centers in inches. Multiply the force F in pounds by the distance L in inches. Then multiply by 0.25. Divide that product by the deflection D in inches. The result is the tension in the belt in pounds.

Do the same with the slack side in precisely the same way. If possible, determine the tension in the slack side simultaneously with the determination of the tension in the tight side. If determined simultaneously results will be more accurate.

Next subtract the tension in the slack side from the tension in the tight

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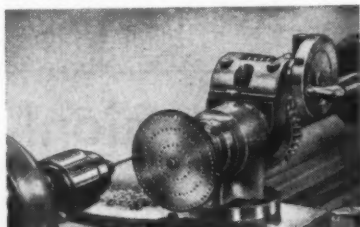
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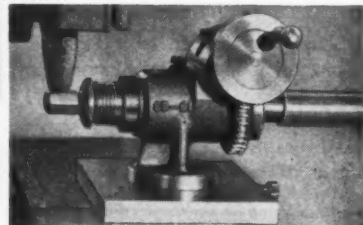


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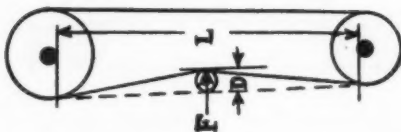
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side. The difference is the so-called "effective pull" in pounds.

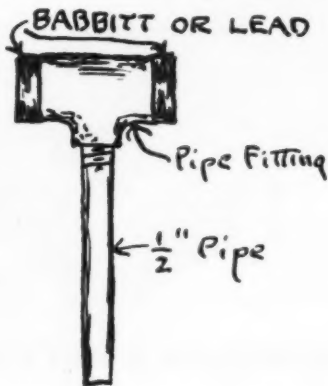
Finally, to determine the horse power transmitted multiply the effective pull in pounds by the velocity of the belt in feet per minute. Lastly, divide that product by 33,000. The result is the horse power being transmitted by the belt.

A good "soft hammer", easily made

Here is a useful and easily made soft hammer—shown in the accompanying sketch. It is nothing more or less than an ordinary standard "Tee" pipe fitting and a half inch pipe. The former, when filled with lead or babbitt, serves as the hammer head, and the latter is the handle.

For pouring, moulds are unnecessary. Simply wrap paper around the rim to form the face of the hammer and to keep the lead from spilling when the metal is poured. Nor is it necessary to fill the Tee entirely full of molten metal; it may be filled mostly with pieces of scrap metal or anything non-combustible to fill the space. Scrap pipe plugs, for instance, are good fillers.

A hammer like this can be made in



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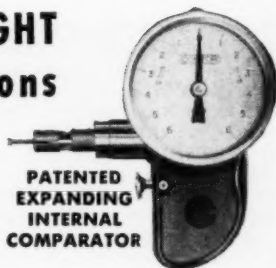
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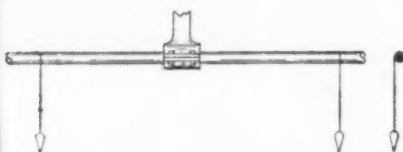
any desired weight because there are so many standard sizes of pipe fittings. The one this writer made weighed about four pounds.

For striking and driving bolts, nuts, shafts, pipe, and similar machine parts that must not be scratched or battered there is nothing better than a soft lead or babbitt-faced hammer. Rawhide-faced hammers and wooden hammers do not scratch or batter, but they usually are not heavy enough for quick performance.

How to check shafting for level and straightness

Figure 1 shows an excellent way in which to align shafting longitudinally. Simply suspend plumbbobs around the

FIG. 1



side of the shaft, as indicated, all being suspended from the same side. If there are at least three such plumbbobs, it is a simple matter to glance along them and see whether or not the shaft is in alignment. If the plumbbobs are rather far apart you can stretch a thread close to the vertical threads leading to the plumbbobs and you can then measure the misalignment, if you wish, with almost perfect accuracy. The plumbbobs suspended in this way are all perfect tangents to the shaft, and, knowing the diameter of the shaft, there can be no question as to where the center of the shaft is all along the line.

As for aligning shafting vertically, to make sure that it is level, one may use an ordinary garden or other hose filled with water, with gage glasses inserted in the ends, as indicated in figure 2. No matter how far the ends of this hose are apart, the water will always assume a perfect level and you can be certain as to whether or not the shafting is absolutely level. The only thing to watch out for is: be sure that there is no air in the hose—that it is full of water—and

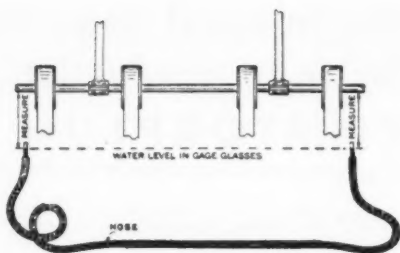
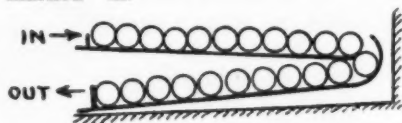


FIG. 2

be sure that the temperature of the water is the same from end to end. If one end of the hose is hot and the other end is cold it will not be accurate.

How to keep stock from becoming stale

Here is a method followed by a plant operator who wants to keep his stock of supplies as "fresh" as practicable. The sketch explains the idea. Arrange two inclined planes as indicated, so that when a cylindrical parcel or package (a barrel, drum, or tube of oil for example) is removed from the bottom at the point marked "out" the remaining parcels will advance by one diameter leaving space at the top where the newest package is inserted—at the point marked "in."

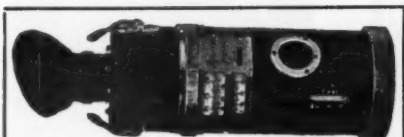


In this way the "oldest" package is always removed and a fresh stock maintained. Each package awaits its turn. There is no possibility that a package will remain indefinitely in the plant without being used.

Fixture holds tubing during checking

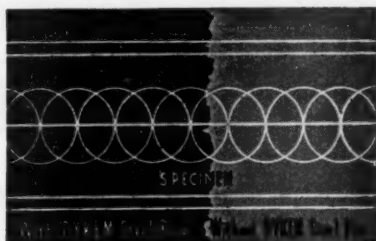
A large manufacturer of automotive parts required a fixture for holding tubing while the wall thickness was being checked. The same high degree of concentricity had to be maintained in their inspection as obtained in the machining of the part. The solution was a rotat-

ing checking fixture which consisted of a precision multiple sleeve mandrel operated by an air cylinder. An automatic valve on the air cylinder controlled the expansion of the mandrel for quick change of the parts and for firm and accurate gripping during the inspection. Inspection was thus placed on a production basis along with the machining operation. The fixture was designed and built by Erickson Tools Div., Cleveland 14, O.



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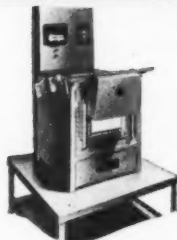
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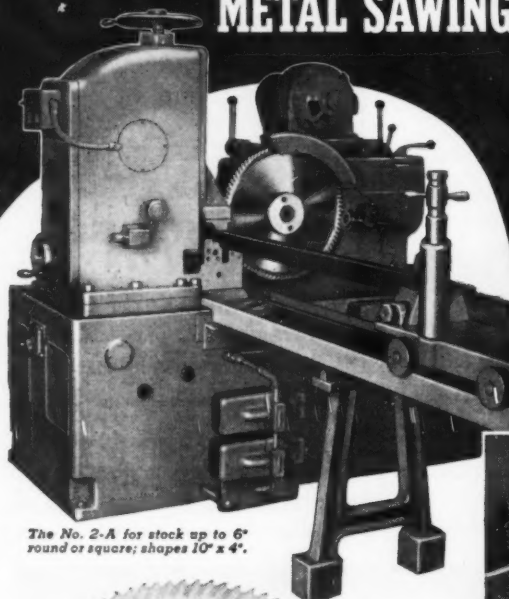
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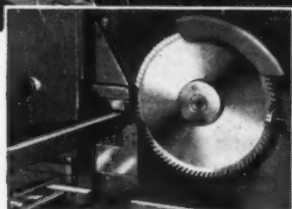
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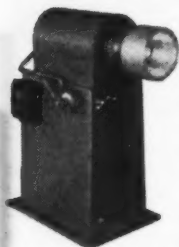
during handling limited brazing output to 360 assemblies per hour in spite of the fact that the gas-air heating equipment for the operation was designed to heat to brazing temperatures a minimum of 500 pieces per hour. Use of notched-coil rings eliminated the hand-

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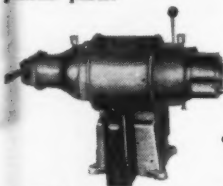
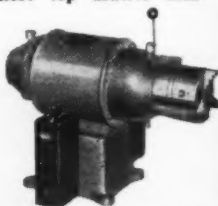


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Preforms are stress-relieved and available in gap form for easy compression into inner diameter grooves, and in lap and butt form for keyed and non-keyed outer surface applications. Beside handling and storage savings and convenience, rings are particularly suitable for exacting applications where the nature of the joint and depth and

Safe, easy detachment . . . without distorting performs is made possible by a notch running along the outer and upper diameter of the rings. Elimination of distortion during handling is particularly useful in applications where tolerances are as close as plus or minus .001".



shape of groove limit the amount of silver alloy to be used. In such applications, specified wire thicknesses and diameters assure that only necessary measured amounts will be used resulting in considerable material savings and the elimination of post-brazing machining of spillage associated with hand-fed and less exacting machine-wound rings.

Notched-coil rings, developed and patented by the Lucas-Milhaupt Eng. Co., 5051 South Lake Drive, Cudahy,

Wis., were used with an improvised gas-air heating unit set aside for development work. Using a mixture of 16 ounces of air pressure with natural gas, the heating unit consists of a 30-prong revolving fixture which is driven by a ½ hp motor through a hydraulic transmission at variable speeds up to 3 rpm. The brazing temperature, which is constant, determines the speed of the rotating work table. Speed, in turn, determines whether one or two operators are to be used.

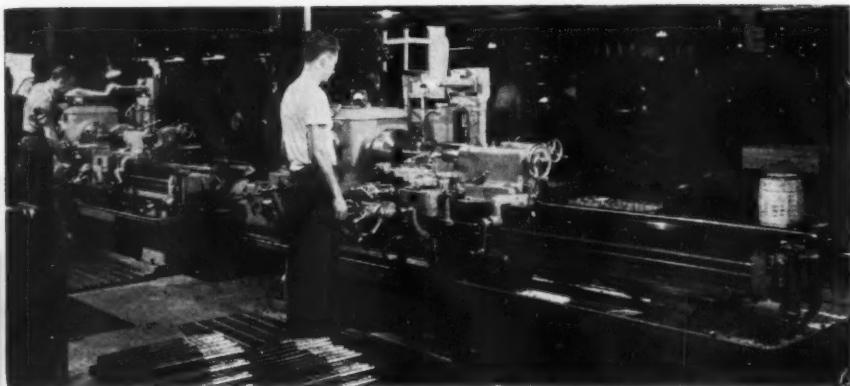
Special drilling unit

The Union Special Machine Co. makes special industrial sewing machines on which one operation is to drill and counter-sink the heavy maple tops.

To get a bigger "throat", that is, more distance between the drill and the support of the drill press head, Union Special designed and built this unit from standard Delta 17-inch drill press heads. The 17-inch drill press heads are

mounted on inverted U-shaped columns giving a 25-inch clearance from column to drill. A special table also was built. The operation is drilling and counter-boring heavy maple parts. The heavy, open slot arrangement of the table allows the chips to fall out of the way. Notice that beneath each spindle a locating plate has been bolted for fast accurate location of the piece to be worked. This is an excellent set up which received much favorable comment from shop men.





Duplicating lathe increases production over 100%

Two Lodge & Shipley Copymatic lathes are used to machine armature shafts. A 16" Copymatic lathe is used to rough and finish turn and cut thread relief on the long end of the armature shaft. A 14" Copymatic lathe is used to rough and finish turn and cut thread relief and chamfer on the short end of the armature shaft.

Material is SAE 4140 steel, heat treated to Brinell 277/311. Tools are Kennametal carbides, grade K3H. A feed of .0187" per revolution is used at a speed of 451 r.p.m.

Over previous methods the new set-up saved 55% time and increased production over 100%. By the former method, machining the long end of the shaft took 21.50 minutes; with the new set-up it was 9.67 minutes. Time of the short end was previously 14.09 minutes; with the new set-up it was 6.30 minutes.

THROW A LITTLE LIGHT ON THIS QUIZ

by Professor Herman Reichardt, Consulting Engineer

Count ten for each question you answer correctly. 80-100 is excellent; 50-70 is good; below 50, take off those dark glasses and try again.

1. A lumen of light is the filament, distance from ceiling or equivalent of one candle of light?
2. A parabolic reflector spreads light rays in all angles, parallel to axis or at right angles?
3. Absorption of light is determined in distance, reflector surfaces or type of light unit?
4. Diffusion of light rays is quality of light at source, height from floor or bringing light rays from more than one angle?
5. A louver is a special type of socket, a shield to prevent glare, or encasement to spot direct illumination?
6. A foot candle is a foot distance from the light source, square foot of area or spacing of light unit?
7. The bluest light is obtained by shaded light, light from South, or from North?
8. Frosted light units tend to reduce image of light source, appear same size or enlarge?
9. Lamberts is a term used to denote type of unit, type of reflector or lumens per square inch?
10. The white fluorescent unit delivers twice as many, three times as many or four times as many lumens of light as the tungsten filament?

Answers to quiz on page 355.

UNMATCHED VALUE

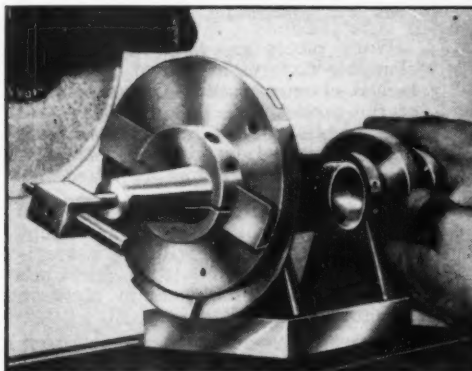
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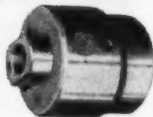
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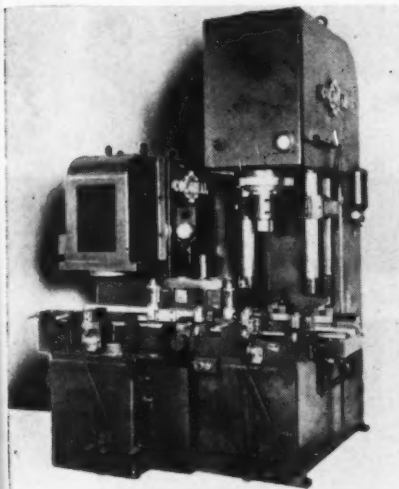
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Semi-automatic transfer interconnects presses

An interesting application of transfer principles to conditions where completely automatic transfer of parts in process is not called for due to limited production quantities is shown in the accompanying photo. The two machines shown are a modified Colonial Broach Co. 35 ton 24 in. stroke hydraulic assembly press and a special 35 ton 15 in. stroke 'inverted' Colonial assembly (or "disassembly") press.



Assembly, right, and "disassembly", left ... interconnected by a track. Two presses are used to press in and remove large sleeves from a pallet before and after honing. In operation, the honing machine, connected to the same track, is located between the presses.

The two units are interconnected by a track. In actual practice, the machines are not side by side but have a honing machine located between them. The track is oval in shape and endless. One rail is flat, the other V-shaped.

The installation was developed for honing of liners before assembling them in cylinder blocks. The liners are placed on pallets (two to a pallet) which ride on rollers on the track connecting the

machines. The pallet is moved manually into place in the assembly press (against stops). Cams lock the pallet in place and the press pushes the first sleeve into the bore of the pallet. The pallet is indexed to a second position and the second sleeve is pushed into place.

The pallet is now moved to the honing machine where the liners are honed. From here it goes to the "disassembly" press where the plunger (operated by a hydraulic cylinder in the base of the machine) pushes each liner in turn out of the pallet bore into the head of the press, from where the operator removes it and transfers it to "stock."

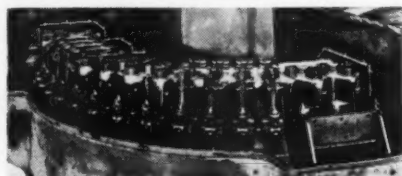
The "disassembly" press is basically an inverted Colonial assembly press (series PA), the low overall height being due to the ability to mount the operating cylinder, etc., in the base of the machine.

Five head rotary automatic surface grinder

Five head rotary automatic surface grinder finishes the sides of connecting rods and connecting rod caps.

Work pieces are held in automatic clamping fixtures as shown on the attached closeup picture. One revolution of the table under the grinding heads finishes one side. Each of the two parts are then turned over into the next fixture station, for grinding the other side.

Automatic sizers are constantly in operation checking the work and keeping all of the pieces within the specified tolerances without the operator's attention. Machine is made by Mattison Machine Works, Rockford, Ill.



A Mattison five head rotary surface grinder ... with special fixture for grinding the sides of connecting rods and connecting rod caps.

RIMAT DIAL BORE GAGES

FOR PRECISION
MEASUREMENT OF:

"O" RING GROOVES
SNAP RING GROOVES
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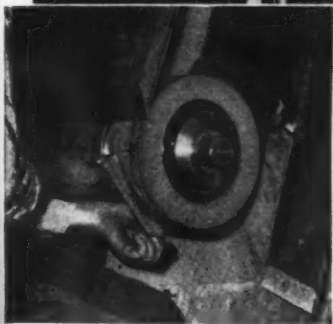
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ANOTHER INGENIOUS IDEA IN BELT BACKSTANDS



Close-up of finishing on a door-plate, initial and final operations entail simply a quick move from one belt to the other.

Photographs by
Coale Pictures,
Berlin, Conn.

The profit-saving advantages of finishing with BEHR-MANNING abrasive belts, are doubly realized in this backstand arrangement at P. & F. Corbin, Division of The American Hardware Corp., New Britain, Conn., prominent manufacturers of building hardware. Here are the big points:

1. A **TWO-MOTORED LATHE**, so the operators work independently, and stoppage of one does not stop the other —
2. **TWO CONTACT WHEELS** and belts (rough and finish) at each end of the lathe. Belts are only a few inches apart, making the roughing and finishing almost a single operation on each piece —
3. **BACKSTANDS ARE RAISED ABOVE**, instead of extending back of contact wheels. The supporting structure is mounted on the lathe itself. Valuable floor space is saved.

This ideal arrangement was devised by Mr. Max Grapski, the company engineer, with the cooperation of a BEHR-MANNING Engineer.

ARE YOU HANDLING your finishing operations the most profitable way? Why not utilize the experience of BEHR-MANNING Engineering Service. No obligation. Write to Dept. BB-8.



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EXPORT: BEHR-MANNING OVERSEAS INC., NEW ROCHELLE, N. Y., U. S. A.

AUGUST, 1951

WHAT'S NEW • WHAT'S NEW • WHAT'S

MTBB

NEW •

Wales drilling machine

features operation simplicity

with adaptability in drilling

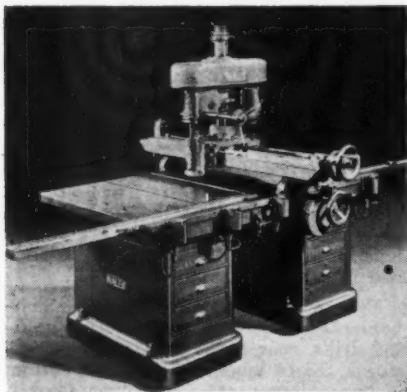
The new Wales Drilling Machine for precision layout, drilling and reaming of holes has just been announced by the Wales-Strippit Corporation, 345 Payne Ave., North Tonawanda, N. Y., specialists in punching and notching equipment.

The Wales Drilling Machine is stated to combine simplicity of operation,

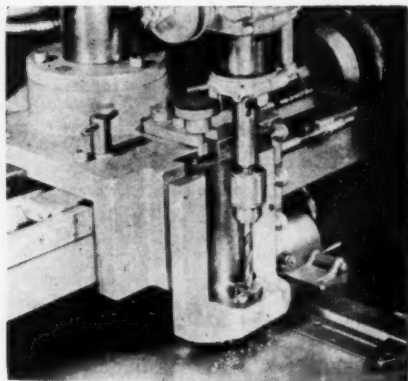
easier locating, drilling and reaming holes in material of practically any length and up to 36" wide.

The precision built drill head with anti-friction bearings, together with guide support which is adjustable vertically to position drill and reamer guide bushing close to top of work, insures close tolerance accuracy. Ex-

Wales Drilling Machine . . . showing the convenient arrangement of all controls for the operator.



Drilling hole in template . . . with the drill head assembly and slide rail locked in rigid position.





ROGERS NEW PRODUCTION FACE GRINDER

The new NT-20 rough and finish grinds gear boxes, pump housings, die blocks and countless other flat faces. Many pieces can be mounted simultaneously on the long, variable speed, motor driven table. High HP grinding head motor, automatic cross feed and many other modern features are included. Keep costs down . . . keep production up . . . write for further information about Rogers NT-20.



Rogers Handy Carbide Saw Grinder

The type SC completely services any carbide tipped circular saw up to 20" diam. and larger on special order. Save production dollars by having an SC in your own plant. Write today.

Samuel C. Rogers & Co.

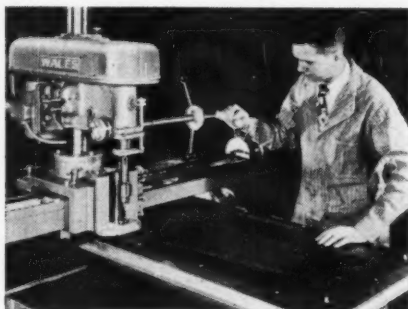
Since 1887

207 Dutton Ave.

Buffalo, N. Y.

tra large bearing area on the drill head assembly base assures the travel at exactly 90° on two accurately ground ways across solid bridge.

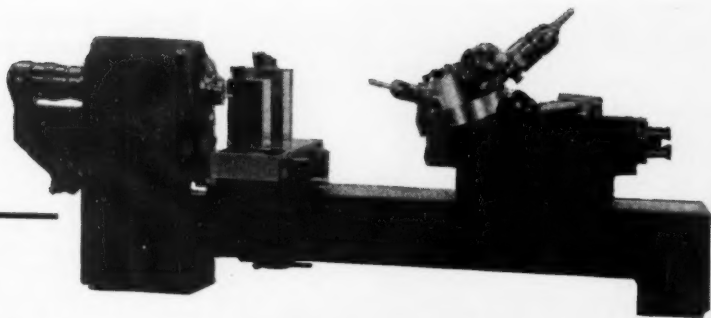
A full-size table provides complete support for work to assure accuracy. Another built-in feature that insures greater precision and longer life of the machine is the hand scraped ways in the table. The work is securely clamped to the long slide rail which moves the work left to right under the drill head. Easier movement of the work is provided by anti-friction ball roller inserts located over the entire table area.



Holes being accurately drilled . . . in a small work piece, one of many similar type operations performed by this versatile unit.

Two-speed gearing, controlled by hand wheels, provides traverse for rough positioning and slow speed for "zeroing in" when locating the drill head on the bridge and locating the work clamped to the slide rail under the drill head. Built-in scales graduated in 1/32", conveniently located for easy visibility by the operator, permit rough locating of the drill head and the slide rail. For "zeroing in", dial indicators calibrated in .0001" are used in conjunction with end measures placed in v-grooves. Air clamp levers rigidly lock both the drill head and the slide rail in exact position.

Two sets of steel drawers are conveniently located in the base for holding drills, reamers and the other accessories. Eight leveling screws on bottom of base compensate for uneven floor.



Produce your small precision parts with

Derbyshire

ACCURACY

Write for Catalog

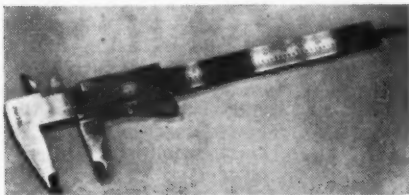
Illustrated:

No. 750 PRECISION Lathe with 22" bed; Ball Bearing Headstock with spring-bind collet closer attachment; Forming Slide Rest; Six-position Turret. Chuck capacity .004" to .315". Spindle speeds to 18,000 RPM.

F. W. DERBYSHIRE, INC.
157 HIGH ST. WALTHAM 54, MASS.

Precision vernier caliper

A new, hardened chrome-steel, one hand operated, Precision Vernier Caliper, is now available from Techno Exports, 15 Whitehall St., Room 612, New York 4, N. Y. This precision instrument permits quick and accurate "direct-reading" measurements of machine and instrument parts. The jaws, knife blades and depth rod are hard-



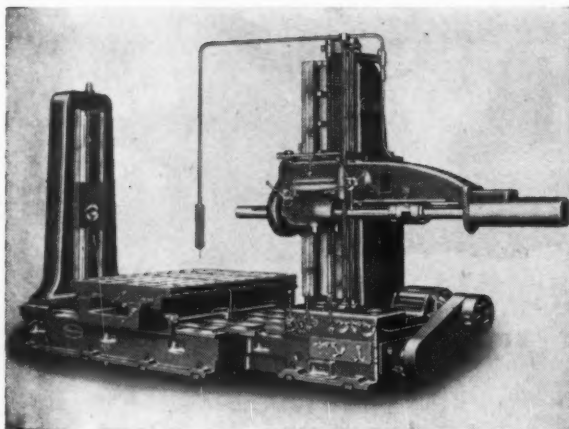
ened to about 55C Rockwell, assuring longer accuracy.

The lower scale of the instrument is graduated to 6", and measures work up to 5 5/16" in vernier readings of .001". The upper scale is graduated to

160 millimeters and measures up to 135 mm. in vernier readings of 1/20 mm. The length of the jaws is 1 9/16" and they are 1/8" thick. The tips of the jaws are bevelled in front for measuring into slots or threads and the back edges of the jaws are flush for measuring close into corners or narrow shoulders.

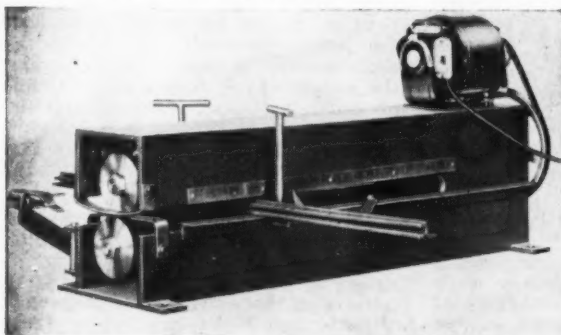
When the slide button of the caliper is released by the thumb, the vernier slide locks itself at any measuring position in the upper gib instead of the lower section, so that the lower slide surface is always flush against the caliper shank regardless of thumb pressure or release, since the pressure of the thumb and spring is in the same direction. The jaws therefore stay parallel at all times, thereby eliminating the inaccurate measurements caused by "closing-up" and "opening-up".

The inch as well as the metric scales are provided on the front of the instrument, making it handy also as a conversion table and for the inspection of parts.



Bullard 4-way bed horizontal . . . boring, milling and drilling machine. This new unit is equipped with an improved fluid drive coupling and brake motor, driving through multiple v-belts. Note the safety pendant control with push buttons, protecting the operator and providing ease of operation.

Model 2024 Metal Slitting Machine . . . cuts up to 20-gauge mild steel. In ripping lighter gauges, such as aluminum, two or more sheets may be cut at one time. Machine's 27" throat depth allows cutting to center of a four foot sheet.



Boring, milling and drilling machine

A new 4-way bed Horizontal Boring, Milling and Drilling machine, built in 4" or 5" spindle sizes, offering many modern features, is introduced by The Bullard Company, Bridgeport 2, Conn.

The heavy box type 4-way bed is claimed to assure a high degree of productive ability with maintained accuracy. This bed supports equally on its four ways a heavy, ribbed box type saddle and table. Bed ways are covered by stationary sheet metal guards as a protection from chips and other foreign materials. Non-metallic bearing surfaces are used under both saddle and table providing long wearing replaceable bearing surfaces.

The saddle guide and feed screw is located between the inner bed ways, minimizing any cocking tendency due to uneven load distribution. Single lever self-equalizing clamps acting on the outside of the outer bed ways give maximum hold-down effect. Table cross-feed nuts revolve in pre-loaded anti-friction bearings and are adjustable for wear. Lubrication pumps provide filtered oil under pressure for gears and bearings, and the large reservoir permits ample cooling of the lubricant.

These new machines are equipped with an improved type of hydrodynamic coupling (fluid drive) and brake motor, driving through multiple v-belts. This type of drive assures smooth, positive

acceleration and stops, as well as absorbing shock induced by interrupted cuts in heavy work.

A safety pendant control with functional push buttons protects the operator and provides ease of operation. The 4" spindle machine has a range of 24 speeds from 8 to 1000 r.p.m. while the 5" size has 24 speeds from 7 to 850 r.p.m.

Portable metal splitter

Small shops without the space for a large shear and bigger shops with too much work for their heavy shears will find that Models 2024 or 1624 Metal Slitting Machine introduced by Wilder Manufacturing Co., Carmel Valley Route, Monterey, Calif., reduce stand-by time, increase output, and cut operating costs, according to its manufacturer.

The machines handle up to 16 or 20-gauge mild steel, depending on the model selected. Its most popular applications are on sheets or coils for gutter, flashings, downspouts, flue pipe, skylight bars, and strip stock for roll forming. In ripping lighter gauges, such as aluminum, it is possible to cut two or more sheets at a time—doubling and tripling shop output. (One man can cut up to 100 feet per minute of single thickness strip.)

A 27" throat depth permits a cut to the center of a four foot sheet of any length. High grade steel cutting blades wear indefinitely without sharpening.

CVA single spindle automatic screw machine

The new CVA 8½" single spindle Automatic Screw Machine is now available for immediate delivery through British Industries Corp., International Machinery Division, 164 Duane St., New York 13, N. Y., Dept. CVA 8. This machine is manufactured in England by E. H. Jones to extremely high tolerances, designed for high speed production with accuracy. The machine takes standard American collets and attachments and is equipped with American motors and electric controls. All threads are American thread sizes.

The machine is designed to produce parts from bar stock of any suitable

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Stop collet for accurate chucking to 23/4" dia. Soft head for easy boring. Lowest price on market! Models 3AT, 3C, 5C.

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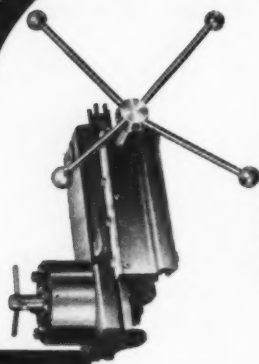
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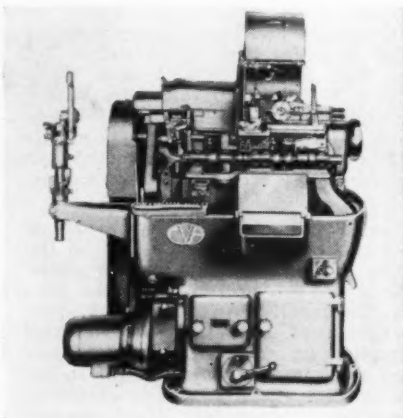
You can convert your lathe to handle profitable turret lathe and screw machine work by installing a self-indexing Newton Precision Bed Turret. All production operations can be performed, plus operations normally done with the regular tailstock. ☆ It's designed for fast, heavy duty operation, accommodates six tools and offers precise repeating accuracy. The slide and bed have ground bearing surfaces to assure stroke accuracy. ☆ Investigate the profitable opportunities offered by a Self-Indexing Newton Precision Bed Turret. Available in lever-operated or pilot wheel models for the following lathes: 10" and 11" Logan, 10" Powr-Kraft, 10" Atlas, and 12" Craftsman. ☆ Favorable delivery dates. Ask your dealer for information or write direct.



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standard section at high speed, and with consistent accuracy. All parts are easily accessible to the operator, thereby facilitating rapid changeover from one job to another. With rugged construction throughout, the machine has ample rigidity at high speeds and under heavy loads. Special attention has been given to the materials and heat treatment of all highly stressed members to insure long life, even under exacting working conditions.



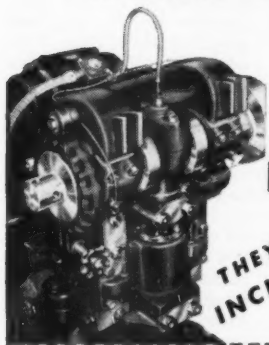
The work spindle is made from nitralloy for maximum durability and freedom from distortion. The turret slide and cross slides are mounted in dovetail slideways. Each slide is precision finished to seat on all five sliding surfaces. The cross slides are provided with micrometer adjustment as an aid to setting.

Two sets of change gears provide 36 spindle speeds, covering a range of from 200 to 6020 r.p.m. Helical gearing is employed throughout, and all shafts are mounted on ball or roller bearings. The ratio of fast to slow spindle speeds is 3:1 or 5:1; 65 cycle times are provided.

A safety clutch is interposed in the driving mechanism between the backshaft and the tool slide camshafts; clutch is arranged to disengage, should undue load be imposed due to interference caused by tool breakage or other causes. Force feed lubrication is included on the machine.

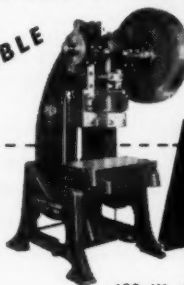
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EQUIPMENT,**



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INCLINABLE**



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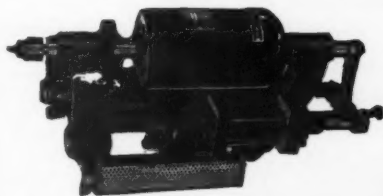
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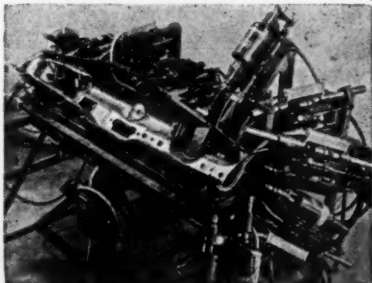
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How to Simplify Production-Precision Drilling of Holes From .004" to .156" Diameter



USE THESE COMPACT DRILL UNITS FOR SIMPLE OR COMPLICATED SET-UPS

These modern drill units speed-up many simple drilling jobs and simplify complicated multi-spindle jobs. Direct drive variable speed spindle provides speeds from 1000 to 10,000 or 2,500 to 15,000 RPM.



Sixteen Electro-Mechano air feed models electrically interlocked and controlled to drill miscellaneous holes in automobile dash board.

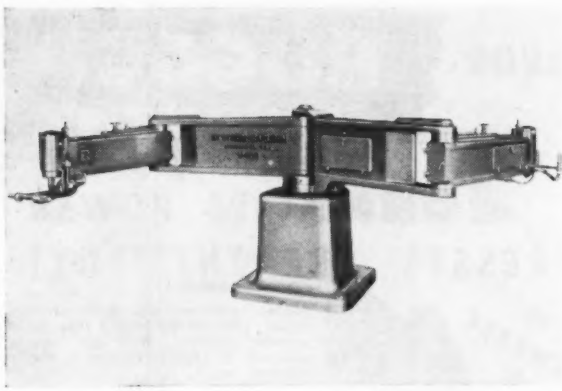
AVAILABLE WITH AIR OR HAND FEED-VARIABLE SPINDLE SPEEDS

Illustrated is the 8" model with air feed and hydraulic control.

THE ELECTRO-MECHANO CO.

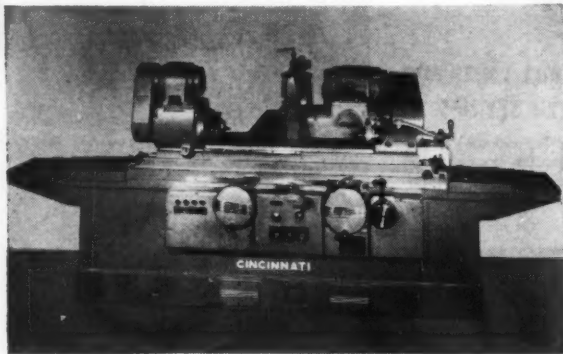
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Write for Bulletin BB-650.



Ekstrom, Carlson Type C-2 Routerdrill . . . equipped with one router head and one drill head. This unit has a 360° swing around the turret mounting post. All electrical, oil and air equipment are housed in the box-type semi-steel arms. Unit is available in either 109" or 84" radial reach models.

Cincinnati 10" Plain Hydraulic . . . grinding machine, recently redesigned for greater operating convenience and improved performance. New a-c motor in headstock obviates need of a d-c line to the machine. Filmatic self-adjusting bearings in grinding wheel spindle give long maintenance-free service.



Ekstrom, Carlson Routerdrills

Ekstrom, Carlson & Co., 1400 Railroad Ave., Rockford, Ill., is again offering their No. V-84 and No. V-109 Radial Arm Routerdrills for working in plywood, plastic or nonferrous metals.

There are five standard types available in each of the two sizes (V-84 and V-109) and are as follows: Combination Radial Arm Routerdrill (Type C-2) fitted with one router head and one drill head (illustrated); Double Radial Arm Router (Type R-2) employing two router heads; Double Radial Arm Drill (Type D2) equipped with two drill heads; Single Radial Arm Router (Type R-1) with only one router head; and the Single Radial Arm Drill (Type D-1) furnished with one drill head.

With a radial reach of 109", the Ekstrom, Carlson No. V-109 will cover all points of two 4' x 12' work tables (set up 180° apart, one on each side of the machine) upon which work stacked in sheets up to a 3/4" total thickness may be routed or drilled simultaneously. Similarly, the Ecco No. V-84, with a radial reach of 84", will take care of work within the dimension of a 4' x 6' work table. All models have a full 360° swing around the turret mounting post.

The 5 horsepower router head spindle rotates at a speed of 15,000

r.p.m., while the dual-speed drill head motor delivers spindle speeds of 7,500 and 15,000 r.p.m. at 1 and ½ h.p., respectively. Both motors are high frequency, totally enclosed, fan-cooled and equipped with precision ball bearings. Statically and dynamically balanced, they insure smooth cutting and vibrationless operation.

The ribbed semi-steel base is flared at the bottom to provide ample floor support. Two hinged doors afford access to a large storage space in the base. The box-type, cast semi-steel arms (aluminum optional) house all of the electrical, oil and air equipment, as well as the spindle raising and lowering mechanism for both heads.

Other refinements include positive adjustable stops and spindle brakes for both heads; operating controls built into the handles; eight-point coolant spray surrounding the pattern follower and routing tool, complete with shut-off cocks and needle valve adjustments for correctly metering the amount of air or coolant; combination drill bushing and hole finder for the drill head; and forced-type lubrication for the bearings of both heads.

This company also manufactures a complete line of routing tools for use with the above machine.

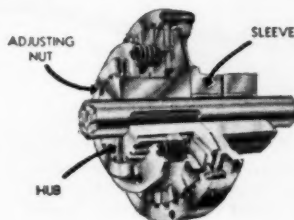
Cincinnati Filmatic hydraulic grinding machines

Several improvements in their 10" and 14-L Plain Hydraulic Grinding Machines have been announced by Cincinnati Grinders, Incorporated, Cincinnati 9, Ohio. The design changes have improved the performance and increased the operating convenience of these machines.

The headstock of these machines has been completely redesigned (see lower illustration, opposite page). It is now powered by a one h.p. a-c motor, eliminating the necessity of a d-c line to the machine; a magnetic brake is built-in; the power is transmitted entirely through V-belts; an eccentric arrangement for the primary counter-shaft provides a way to adjust belt tension and change the belt on the four step pulley. The bed is 2" lower than before; being now only 39½" from the

The NEW Improved series of HILLIARD Slip Clutches

- PROTECT YOUR MACHINERY FROM DESTRUCTIVE OVER-LOAD
- IMPROVE THE CONTROL OF YOUR REWIND STAND



REGULAR SERIES—From 50 inch lbs. to 300,000 inch lbs. torque. Prevents transmission of over-load. Constant torque clutches can be pre-set.

NOW AVAILABLE — Adjustable while running constant tension clutches. Provide ample friction surface for heavy duty use in reeling and winding operations.

THE NEW LIGHT SERIES—high capacity in small size. From 10 inch lbs. to 500 inch lbs. torque. Metallic plates, disk springs. Constant torque—easily adjustable.

- SAVES MONEY . . .
- INCREASES PRODUCTION . . .

FOR DETAILED INFORMATION WRITE FOR
BULLETIN NO. 300

Also manufacturers of over-running and
Single Revolution Clutches.

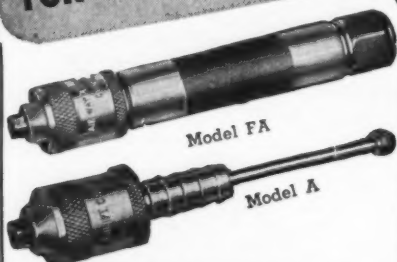
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126 W. Fourth Street Elmira, New York

Air-O-Chek

THE VALVE WITH
THE INTERNAL
FULCRUM LEVER

FOR AIR AND LIQUIDS



An invention in value means

Ingenious lever arrangement makes conventional packing stem and gland unnecessary. Saves air. Saves maintenance. Hundreds of thousands are in use in leading factories, machine shops and foundries. See your jobber or write direct for full details.



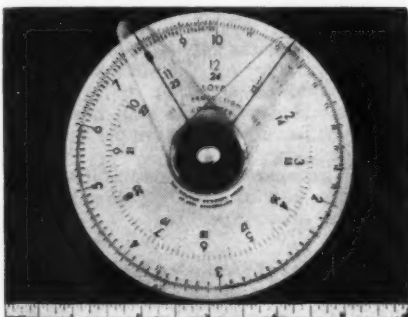
AIR-WAY PUMP & EQUIPMENT CO.
1054 N. Kilbourn Ave. Chicago 51, Ill.

floor line to the centers. Grinding wheel collets are designed for 12" hole wheels, for continued usefulness on smaller machines after the o.d. wears beyond the size for efficient grinding.

The Filmatic bearings for the grinding wheel spindle have been retained. These bearings are self-adjusting for every grinding condition, and according to the company's records, they run for years without maintenance.

Multiple purpose computer

Time and motion study calculations can now be made at the desk or at the operation with a new pocket tool for estimators, time and motion study men and supervisors. Called the Loyd Time and Production Cost Computer, it is a recent development of the Willer Sales Co., P. O. Box 10008, International Airport, Los Angeles 45, Calif.



Eliminating separate pencil calculations and slide rule manipulations resorted to by time keepers, cost estimators and production schedulers to determine manufacturing costs or job status, the Loyd Computer combines these steps in simple unitary functions. This development fills the need for a device which allows the completion of time analysis through the conversion to the monetary factors without intermediate pencil calculations.

Basically, this device is a plastic 4" circular disc upon which are concentrically superimposed a time scale and log scale. In application, two movable arms integrate the time clock in terms of man hours, unit or aggregate product cost, job efficiency and relative proportions.



Cut grinding costs . . . with rugged **QUEEN CITY Grinders**

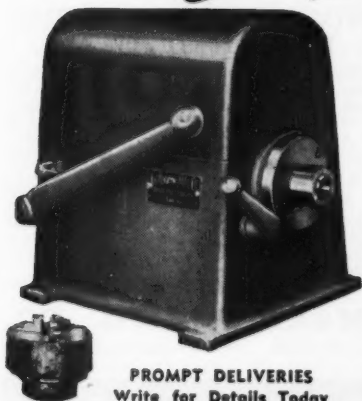
Queen City Grinders are built to stand up under the heavy work that pours through the shop daily. Noted for their durability, freedom from downtime and low cost, Queen City Grinders cut grinding costs to the bone. • Order today a battery of these low cost grinders and eliminate "ganging up" around one lone grinder.



QUEEN CITY
Machine Tool Co.
235 E. 2nd St.
Cincinnati 2, Ohio



The **COLBORNE** **SPEED LATHES**



PROMPT DELIVERIES
Write for Details Today

**SPEED UP FINAL OPERATIONS ON
DIES • GEARS • SCREWS • LONG RODS**

A recent addition to the COLBORNE line of Speed Lathes is the Series 30 machine. This speed lathe is indispensable for economical polishing, grinding, burning and lapping.

Very compactly constructed to do highest quality work with the COLBORNE features of spindle bearings running in oil, instant stopping brake, easy opening collet and standard speeds of 600-920-1720-3280-4800 RPM using 3/4 H.P. motor and cone pulleys. Collets and chuck may be used.

For more production per day choose COLBORNE.

COLBORNE MFG. COMPANY

BUILDERS SINCE 1879

157 DIVISION ST.

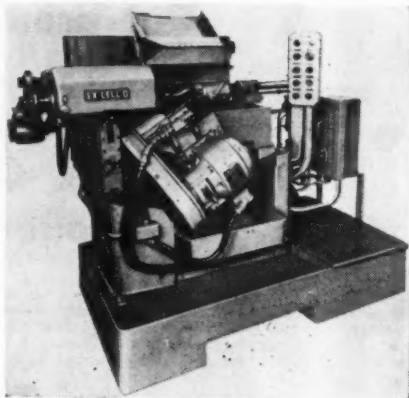
CHICAGO 10, ILL.

Aircraft compressor blades milled by Ex-Cell-O machine

Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 32, Mich., announces that a standard machine for milling the airfoil form on jet aircraft compressor blades is now available.

The machining cycle is completely automatic, except for loading the work, pressing the start button and unloading the work at the end of the cycle. Blades are located from the finished root form (as ground on the Style 85 Ex-Cell-O Two Wheel Form Grinder) at one end and from a center in the other end. Accuracy of the airfoil form is assured by the use of master cams made directly from the engineer's glass layouts. The coolant equipment also has automatic controls.

The Ex-Cell-O Style 86 Precision Profile Miller mills the complete airfoil form including leading and trailing edges. The work is supported rigidly by back rests throughout the cutting stroke, thus the cutting pressure



cannot distort the blade. When the start button is pressed, the headstock, tailstock and back rests are clamped hydraulically. The work moves lengthwise across the cutter at an adjustable rate of speed, and at the end of every

MULTIPLE DRILLING with a . . .



MULTI-DRILL

**Increases Capacity
Up to 800%**

**ADJUSTABLE TO ANY HOLE PATTERN
FITS ANY DRILL PRESS**

If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern — is compactly built to permit easy, unhampered operation with drill jigs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long and short run multiple drilling jobs with ease and economy. The MULTI-DRILL will drill on hole centers as close as $\frac{1}{8}$ " — handle drill sizes up to $\frac{3}{4}$ " in steel. Special adaptations available.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

COMMANDER MFG. CO.

4227 West Kinzie St.

Chicago 24, Illinois

Product of *Commander* Builder of Production Tools

cutting stroke the headstock, tailstock and back rests are unclamped and the work is indexed. The amount of movement during indexing and the total number of indexes are determined by the positioning of pins in an index plate. After the last cut, the machine comes to rest with the work raised from the cutter and the headstock, tailstock and back rests unclamped.

Round shank type holder

A hand type holder with a round, knurled handle is being offered for general industrial stamping by M. E. Cunningham Co., 228 E. Carson St., Pittsburgh 19, Pa. This new model is the same as the standard Cunningham "Wedge-Grip" hand type holder in all respects except shape of the handle.

While the "Wedge-Grip" model is recommended for most applications, certain stamping operations are performed more efficiently when the workman can get a full grasp on the shank. The round shank is knurled to provide a firm, positive grip.

The design includes a patented quick change snap slide for changing type inserts and for retaining the type pin in the holder. This holder can be made for one or two lines of type, with any size character.

Boring bars feature new design

An innovation in design, stressing a square slotted sleeve which is inserted in the round hole of a boring bar, has just been introduced by Formed Tools Co., 43043 Grand River Ave., Novi, Mich. There is no brazing or sweating required to insert these square sleeves; the operator simply reams and taps a role, inserts the sleeve, and pins it in place. The tool-locking screw and back-up screw are tapped in the boring bar body.

These sleeves range in size from $3/16"$ square to $1\ 1/16"$; the length is equal to five times the square slot in the smaller sizes, and four times the square slot in the larger sizes. These devices are made from mild steel and can be surface hardened after fitting. Their use is stated to result in much lower cost and in reduced set-up time, as well as in increased strength in the boring bar.

QUALITY

Depends on

ACCURATE INSPECTION



Accuracy of measurement depends on the precision of the measuring tools. Provide your Shop and Inspection Department with dependable and proper Inspection Tools. MEEHANITE METAL TOOLS, made to close tolerances, are furnished in many types.

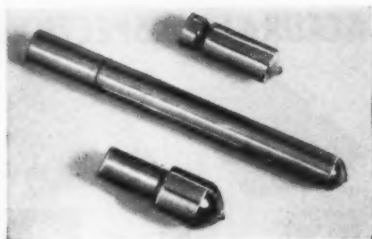
Surface Plates - Box Parallels
Slotted Angle Plates
Universal Right Angles
Flat Parallels - Lapping Plates
Toolmakers' Knees - Straight Edges
Masterangle Plates
Angle Attachments

Surface Plates Rescaped Like New

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INDUSTRIAL DIAMONDS &
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Use HAYFRED DIAMOND TOOLS

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Offices: 1247 Main St., Springfield, Mass.

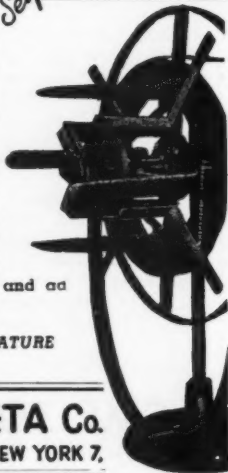
WESTLEN REELS

*Adjustable
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 20". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.

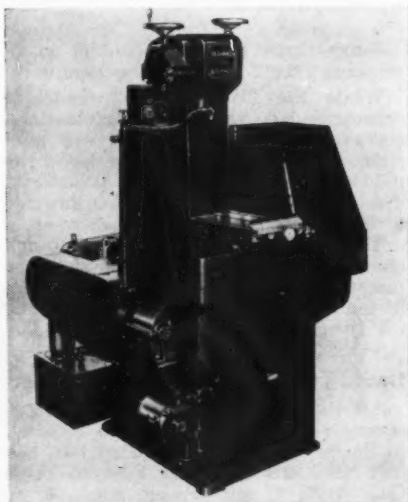
SEND FOR LITERATURE

The RULETA Co.
27 WARREN ST. NEW YORK 7,



Hammond wet abrasive belt grinder

Hammond Machinery Builders, Inc., 1614 Douglas Ave., Kalamazoo, Mich., has introduced a new heavy duty 8" Wet Abrasive Belt Grinder, known as Model V8-WP. It features a new patented power reciprocating table with tilting workholder, and a water-cooled belt platen (patent pending). The machine is designed for production finishing and surfacing parts of ferrous, ceramic, plastic, and thin ferrous parts. Thin sectioned parts can be finished without danger of distortion.



The power reciprocating table travels on hardened steel ball bearing ways and is driven by a V-belt from a small motor to a reducing gear and crank disc. Table travel is adjustable from 0" to 8", and the stroke speed back and forth across the abrasive belt can be varied to suit the work being done. The construction of the tilting workholder is stated to make it effortless and easy to bring the work to loading, unloading and grinding positions.

Features of the water cooled platen make it possible for the downward pull of the abrasive belt to create a continuous film of coolant between the back of the belt and entire face of the plate.

The water cooled platen eliminates distortion of both work and platen usually caused by heat.

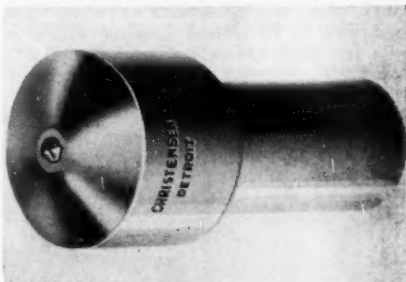
The self-contained coolant system employs two coolant tanks with a combined capacity of 35 gals. The Model V8-WP also can be equipped with a plain table or manual reciprocating table, and for water main connection instead of with self-contained pump and tank unit.

Single point diamond wheel dressing tool

Announcement of a complete line of single-point diamond wheel dressing tools is made by the Christensen Diamond Tool Co., Dept. AO, 9607 Traverse St., Detroit 13, Mich. Manufactured in a full range of sizes for all grits of grinding wheels, the tools feature an exclusive "C-metal" mounting method for holding the stone. The manufacturers state that this mounting method assures the diamond always holding its setting, despite the severity of vibration, or the intensity of alternate

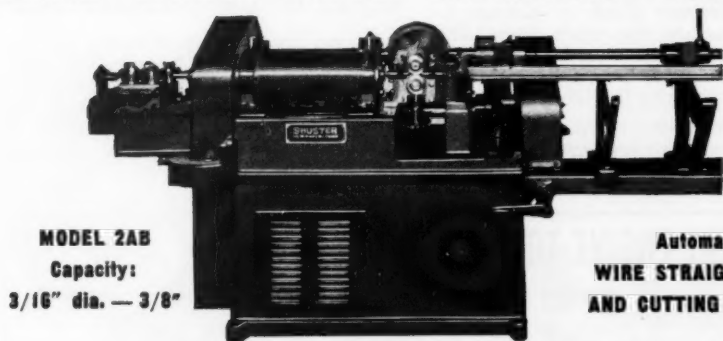
heating and cooling caused by frequent wheel applications.

Each Christensen single-point tool contains one whole natural diamond, ranging from fractional to three carats in size. The tools are designed for use on any straight-face or form wheel dressing operation, and are said to be



especially useful for shops where diamond usage is relatively low, or where a diamond tool may be issued to each individual operator. The tools are sold under an unconditional guarantee of satisfaction.

This New, Economical "SHUSTER" Cuts Costs AND Accurate Lengths!



MODEL 2AB
Capacity:
3/16" dia. — 3/8"

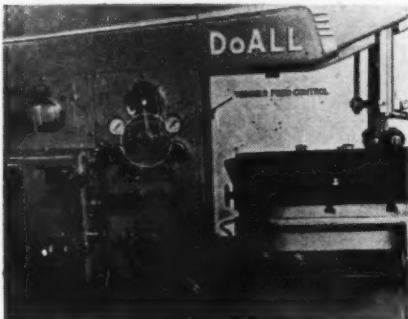
**Automatic
WIRE STRAIGHTENING
AND CUTTING MACHINE**

Shuster Wire Straighteners are available
for wire .025" to 11/16" diameter

Mfd. by METTLER MACHINE TOOL, INC.
19 Congress Ave. New Haven, Conn.

DoAll vernier power feed

A recent improvement of power feed control on its Contourmatic hydraulic-operated band tooled machine is announced by the DoAll Company, Des Plaines, Ill. This new refinement gives the operator more sensitive control of the hydraulic table when bandsawing thick steel work sections or when line grinding or diamond sawing vitreous and frangible materials or hardened alloys.



As shown in the close-up of the Contour-matic control panel above, the table infed knob has an added vernier control at the side, which enables the operator to start a cut with a feed rate that will prevent shock or damage to the band tool or the work piece. The value of this close control is evident when it is realized that 200 lbs. pressure is available to move the table.

The other knobs on the centralized control panel that save operator's time in set-up and adjustment while the

machine is running perform the following functions hydraulically: band tool tensioning, guide post positioning, table tilt, direction and speed of 16" table stroke, work feed pressure, and tool speed range infinitely variable between 40 and 10,000 f.p.m. Hydraulic brakes on both wheels are automatically set if the band breaks or when the drive motor is shut off.

Basket for sulphuric acid anodizing

Production anodizing of rivets and other small parts at low cost is provided by an anodizing basket announced by the Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill.

Designed for use in sulphuric acid solutions, the basket is made of bakelite with an aluminum center stem. The cover is equipped with a compression spring for maintaining the positive contact pressure essential to uniform anodizing results.

In use, the parts are dumped into the basket and "shaken down". The cover is then pinned down under compression by means of the pine through the stem. The basket illustrated above is 12½" high by 5¾" i.d. Other sizes are furnished to specifications.

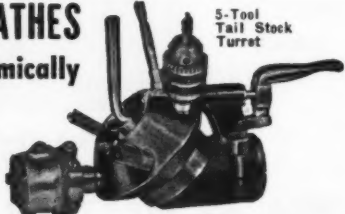


CONVERT ENGINE TO TURRET LATHES

quickly . . . easily . . . economically

Several sizes for lathes up to 24" swing. For forming, roughing, boring, drilling, tapping, finishing, etc. without stopping lathe or changing tools. (Attaches to tailstock spindle).

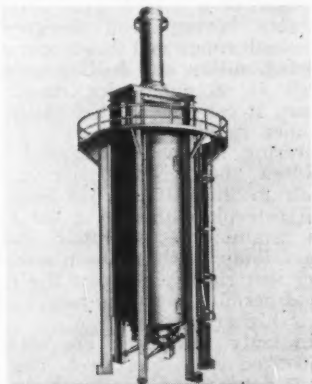
Send for catalog of Dividing Heads, Belt Sanders, Swing Grinders, Turret Attachments, etc.



JEFFERSON MACHINE TOOL COMPANY, 700 W. Fourth St., Cincinnati 3, Ohio

Struthers Wells direct fired heaters

Struthers Wells Corporation, Warren, Pa., announces a standard line of direct fired heaters, with capacities of



100,000 to 15,000,000 B.T.U. per hour. This equipment is designed for a wide range of applications, including indirect circulating heating using heat transfer

mediums such as Dowtherm, and for direct heating of vapors and liquids. Temperatures range to 750° F. or above.

The equipment is designed for high thermal efficiencies and trouble free operation. Complete automatic control systems are available which largely eliminate operating attention. Operating costs may be comparable with those for steam boilers in smaller sizes. Completely engineered systems including all necessary equipment are available if required.

If a manufacturing process requires heat at temperatures above the existing steam supply, or if operation may be improved or speeded up by higher temperatures, this equipment will be of interest. These direct fired heaters may also be used to supplement existing boiler capacity, or for installation in remote plant locations to save the cost of new steam facilities. The illustration shows a typical Struthers Wells vertical heater, for firing with gas or oil.

BLANKING, NOTCHING,

LESLIE MODEL A
HAND PUNCH PRESS
\$120.00 F.O.B.
CHICAGO

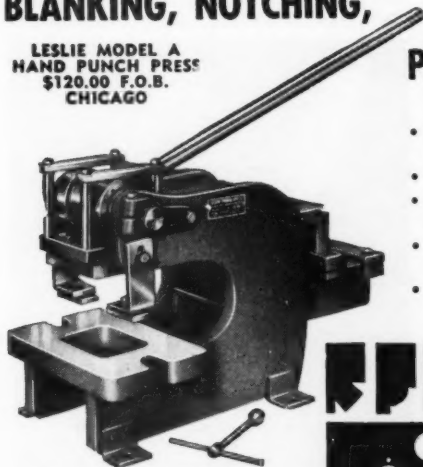
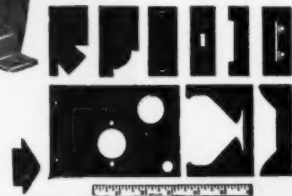


Diagram illustrates versatility of Press—each blanking done with 1 stroke.



PARTING, EMBOSSING ?

- FAST DIE CHANGES, with standard Punches and Dies.
- 15 Ton capacity.
- Patented Leaf Assembly provides accurate punch and die alignment.
- 6" throat depth permits reaching to center of 12" piece.
- Large Punch Plate and Bed permits blanking over big areas.

Write now for illustrated catalog and circular showing punches and dies available from stock.

Tool your jobs at low cost from our wide variety of standard punches and dies.

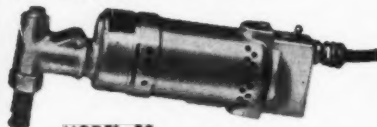
LESLIE WELDING CO., 2941 Carroll Ave., Chicago 12, Ill.

JEMCO ---

Electric Nibblers



MODEL 75



MODEL 50

For speeding up nibbling jobs, Jemco Electric Nibblers provide an effective and economical solution. Made in two models . . . No. 75 for cutting 14 gauge (.0747). . . . No. 50 for cutting 18 gauge (.0478) hot rolled sheet steel. Other materials in proportion. Jemco Electric Nibblers handle flat or corrugated sheets . . . uneven surfaces . . . and can nibble out corners! Cutting may be started anywhere on the material if access hole for anvil is made. Tools operate on either DC or AC . . . 110 or 220 volts. Feed: 3 feet per minute. Nibbling is done better, easier and faster with Jemco. Send today for full details and informative folders.

MANUFACTURED BY
JEFFERSON
ENGINEERING
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269 WALKER ST. DETROIT, MICH.

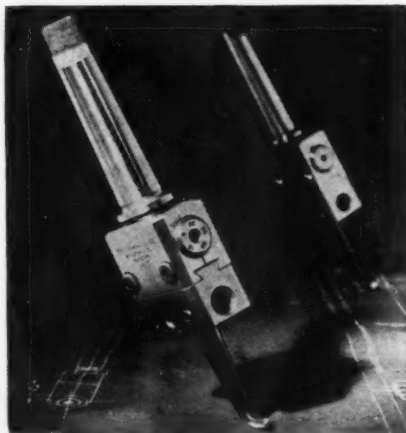
Maxwell adjustable boring head

The Maxwell Company, 220 Broadway, Bedford, Ohio, has announced production of a new Mastur Series 50 adjustable boring head designed to handle both rough and finish operations on boring, milling and drilling machines as well as on automatics. Small and compact, it can be inserted easily and positioned rapidly.

Featuring a more substantial body and block, the Series 50 boring head (at left in illustration) has been designed to replace the No. 5 (at right) while retaining its operation characteristics. Body width has been increased to augment rigidity, support the dovetail and permit the tool to take heavier cuts at higher speeds.

Both body and block are made of heat-treated alloy tool steel. The tool block is dove-tailed into the body, and all fitting surfaces are ground to assure precision fit and long life.

The adjusting head is graduated in 50 divisions to provide readings in thousandths, and the tool body contains graduations to permit vernier readings of 0.0002". Constructed of tool steel, the adjusting screw is hardened



before threads are ground to assure maximum life and accuracy.

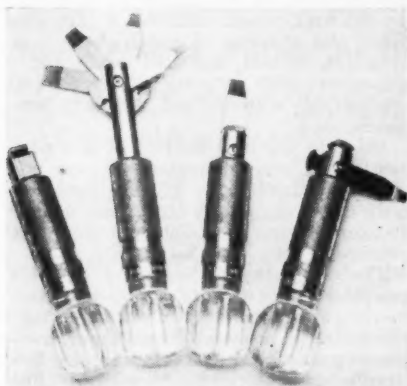
The Series 50 boring head has a $\frac{3}{8}$ " capacity minimum, with forged high speed steel bit, and 7" capacity with

alloy steel bar with square bit. Shanks available for use with this model include Nos. 2, 3 and 4 Morse; 7, 9 and 10 Brown & Sharpe; 1-inch straight; and other sizes upon request. In addition, this tool can be furnished with cutters having cemented carbide tips.

Compact 4-blade screwdriver

A new four blade screwdriver has been designed by the Shelton Plane & Tool Mfg. Co., Shelton, Conn. This compact, sturdy tool is only 4" overall when not in use and has no projecting screwdriver blades to poke holes in the pocket. The four tool steel blades will accommodate from a No. 1 to a No. 14 screw. The same full size handle gives ample leverage when using the smallest blade. For extra leverage or hard-to-reach screws, this screwdriver can be used in offset position.

Four tool steel screwdriver blades, heat-treated and precision ground, pivot on a solid rivet between the retractable side frames. To use, merely pull out the side frame and blades, select the proper blade for the job, leave the others between the side frames and push back into handle. The plastic handle and knurled barrel are a comfortable size and afford plenty of leverage. There are no loose blades



to get lost and no complicated mechanism to go wrong. The new tool is a practical and efficient unit for mechanics, craftsmen or hobbyists.

August, 1951

SAVE
EYE FATIGUE with
VIMCO *Lights*

And when you prevent eye fatigue . . . you keep production up . . . you eliminate costly machine errors . . . and you help prevent personnel accidents. Remember, too, your customers expect your machines to be fully designed in every detail . . . that means they want the "on the point" lighting Vimcolights can provide. Vimcolights are easy to install, long lasting and backed by 30 years of specialized lighting experience.

Send for bulletin 74

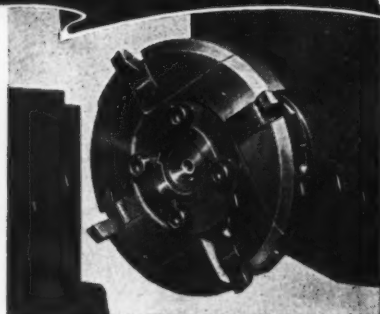
VIMCO MFG. CO., Inc.

109 Brayton St.

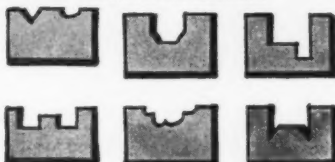
Buffalo, N.Y.

NEWFIELD

UNIVERSAL FLY CUTTER



Above: FACE MILLING



Above—a few of the many cuts that can be made with the Newfield Universal Fly Cutter in ONE operation on a horizontal or vertical mill or drill press. Individual adjustable bit holders permit slots of any shape to be cut $\frac{3}{16}$ " to 2" wide.

STANDARD BITS MAKE 4 TO 6 DIFFERENT CUTS IN 1 OPERATION!

For many types of milling, light metals and plastics as well as steel, there is no longer need for special cutters. A single Newfield Universal Fly Cutter, utilizing any type of standard high speed steel or carbide bits, makes multiple cuts in one operation. In contrast with expensive specially ground cutters, the standard bits used in the Newfield are easily and quickly ground in your own shop, readily replaced or reground for other work, at small cost. There is practically no down-time if a bit is broken.

The Newfield fits all standard arbers, turns to any required speed for fly cutting, slotting, surface and straddle milling, gear cutting, disc and gasket cutting. Standard sizes 4", 6", 8", 10".

Write today for details of this versatile, production-upping, money-saving tool.

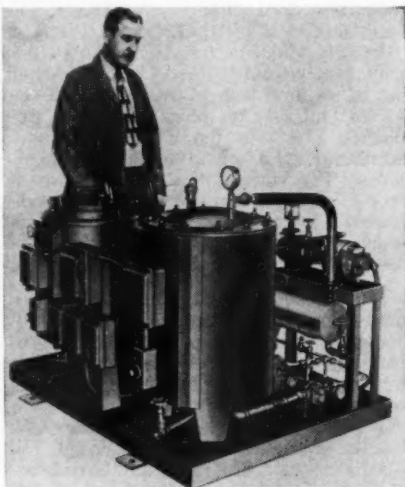
NEWFIELD MACHINED PARTS CO.

210 W. Seventh St. Los Angeles 14, Calif.
Export office: States Trading Co., 401 Broadway
New York 15, New York
Cable: STRADESO, New York



Hoffman oil conditioner unit

A new 25-40 g.p.h. oil conditioner unit, specifically designed for small-batch clarification of used hydraulic, lubricating, run-in and transformer oils, has been introduced by the Filtration Division of the U. S. Hoffman Machinery Corp., 219 Lamson St., Syracuse, N. Y.



Both insoluble and soluble impurities are reported to be completely removed by the unit, which combines a cartridge filter (for removal of metal, gums, tars, residues, carbon, dirt and sand) and a vaporizer (for extraction of free and emulsified water, fuel dilution, air, gases, etc.).

Prior to the introduction of this particular oil conditioner model, the advantages claimed for it were available only in the company's larger size models to users having 50 to 600 g.p.h. flow rate requirements.

The advantages, according to the manufacturer, include simplicity, convenience and economy in purifying turbine, circuit breaker, transformer, vacuum pump, cable, compressor, hydraulic and refrigeration oils to "like new" condition. Avoidance of high maintenance costs is stressed.

The cartridge filter and vaporizer which form the unit are mounted on a common base, portable if desired, and

are complete with all necessary electric and pump connections. Filter and vaporizer may be operated singly or together. The overall dimensions of the new oil conditioner are 54" wide, 42" deep and 37" high.

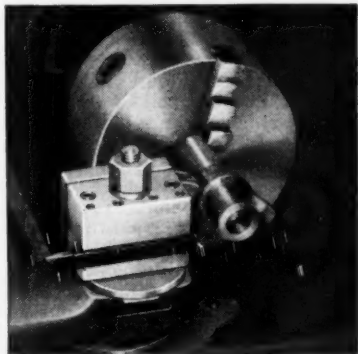
Universal lathe tool holder

The South Bend Lathe Works, 426A E. Madison St., South Bend 22, Ind., has introduced a new tool holder of the universal type. Known as the 10 in 1 tool holder, this device is supplied in five sizes for South Bend Lathes and is stated to be easily adaptable for use on some other makes.

Constructed of heat-treated steel, this tool holder features screw adjustment for tool height. Once adjusted, tools of the same type can be changed without disturbing the height adjustment. This 10 in 1 tool holder is supplied with a self-aligning knurling head and a pair of medium diamond knurls. Coarse and fine diamond knurls; and coarse, medium, and fine straight pattern knurls are available. Boring tools, cutting-off blades and a set of four ground cutter

bits are available for boring, cutting-off, turning, facing, and threading operations.

The manufacturer recommends the 10 in 1 tool holder as simplifying the



Patented

tool holding problem. Its use is said to eliminate the need for the many different types of tool holders usually required.

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Non-rusting — good looking

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In 15 sizes, ranging from 3 x 4 x 12 and up.



UNIVERSAL ANGLES
In 10 sizes, ranging from 4 x 3 3/4 x 5 and up.



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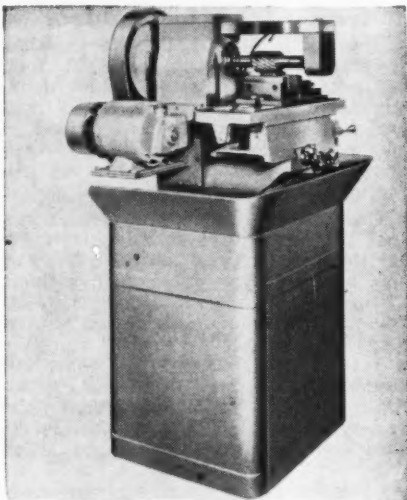
Viking Speed-Mill features wide speed and feed ranges

The new No. 618 Viking Hydraulic Speed-Mill, featuring fast milling of small parts requiring close limits and fine finishes, has recently been introduced by Viking Industries, Rockford, Ill. The exclusive hydraulic system of this unit offers additional flexibility for custom tooling and infinite feeds, the manufacturers state.

The machine is built with an automatic, hydraulic table cycle. Since the hydraulic motor and the coolant pump are built as one unit, they are direct driven by a single shaft. The assembly is located at the right side of the machine, easily accessible. This hydraulic cycle provides infinite cutting feeds from $\frac{3}{8}$ " to 24" per minute, with rapid approach (180" per min.) and quick return (250" per min.). The operator simply loads the machine, starts the cycle, and unloads the work after its automatic stop.

An ample working surface is provided by a 6" x 18" table with a $1\frac{1}{8}$ " T-slot. The maximum table travel under power is 8 $\frac{1}{2}$ ". Infinitely variable hydraulic feeds provide cutting lengths of up to 7" maximum. The unit's flexibility permits a $1\frac{3}{4}$ " transverse movement of the spindle and a 7 $\frac{1}{2}$ " vertical adjustment of the table. The working distances provide a 3" maximum from the centerline of the spindle to the underside of the overarm; an 8" maximum distance from the face of the spindle to the face of the outboard arbor support bushing; the Speed-Mill accommodates milling cutters up to 6" in diameter.

Four spindle speeds are provided by a $\frac{3}{4}$ h.p. motor and v-belt drive furnishing power direct to the spindle. Standard pulleys furnished with the unit provide four spindle speeds of 200, 375, 625 and 975 r.p.m.



Rigidity and accuracy are built into the 2" diameter spindle, which runs in grease-sealed Timken bearings. The spindle has a 17/32" through hole and a No. 9 B & S taper for mounting arbors, shanks and adapters. The spindle is stationary, and work is adjusted by raising or lowering the table. Extra rigidity is provided by the 4" x 1 $\frac{1}{2}$ " rectangular steel overarm, equipped with a bronze bearing for outboard bearing support.

SAVE ON PRODUCTION TOOLING COSTS with

CARDINAL ~~SPEED VISE~~

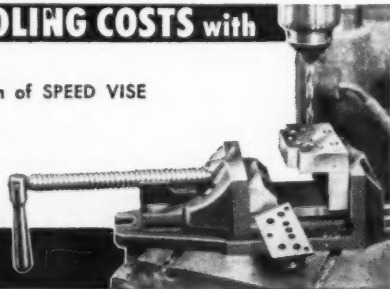
The exclusive, quick-acting clamping mechanism of SPEED VISE accommodates a wide variety of parts.

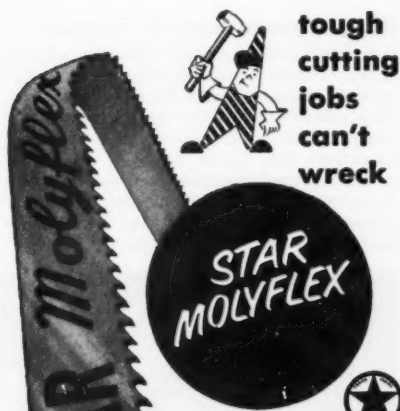
A HUNDRED JIGS IN ONE

Drill jigs are simpler, smaller and cheaper when made for use in a SPEED VISE.

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Want a blade that's rugged, that does a better cutting job for you? Here you are! By actual test Star Molyflex Blades cut 23.8% more SAE 52100 ball bearing steel

than the average of eight other leading high speed blades! Practically indestructible, too—Molyflex High Speed Steel Blades are shatterproof and unbreakable in a frame. Every blade is absolutely uniform—teeth are precision-set. Available in sizes and pitches for any cutting job.

STEELRITE METAL MARKING CRAYONS

These crayons mark on hot, cold, damp, or grimy metals—withstand pickling, will not affect enamel application. Made of extruded soapstone in a variety of shapes and sizes.

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The STAR Line is complete—there's a STAR Blade that's right for every cutting job a hack saw or band saw can handle.

CLEMMISON BROS., INC.

Middletown, N. Y., U. S. A.

Manufacturers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and the Clemmison Lawn Machines.

NOW there are **THREE** in the WALTON FAMILY



The Walton Company has added Walton-American Tool Holders to its line of time- and labor-saving tools—the well known Walton Tap Extractor and its companion Reps Pipe and Stud Extractor.

WALTON TAP EXTRACTORS



Universally used for removing stubborn, balky taps that break off deep in threaded work. Quick, easy, inexpensive. Will not damage threads.

WALTON-AMERICAN TOOL HOLDERS

Many holders in one. Head will swivel around an entire circle. May be set for straight, right or left-hand offset positions. Will hold with perfect grip any size square or round tool bit or boring bar.



REPS PIPE AND STUD EXTRACTORS



When faced with broken pipes or studs that defy movement—here's the tool. Makes a strong, four-point grip without need for hammering or pounding. Hardened steel—will remove any material.

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That Occasional Piece or Quantity
Production Job, Have on Hand



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SINCE 1910

10 LBS. OR 10 TONS

Insist That Your Dealer Supply
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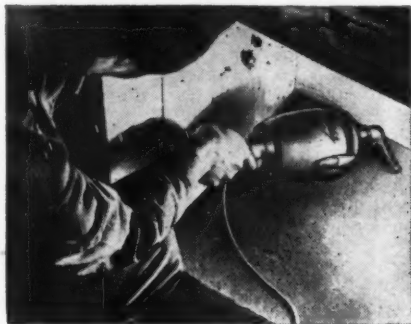
"...The Ball &
Socket Joint
with the
Toggle Action"

Write For Folder!

B. M. ROOT CO.
YORK, PENNA.

Air pressure vacuum cleaner

Syntron Company, 300 Lexington Ave., Homer City, Pa. has developed a new vacuum cleaner for industrial use. The cleaner operates on high pressure compressed air and is for cleaning stockbins and dusty or linty machines; it is also useful under explosive conditions where electric cleaners would present a hazard, and for automotive cleaning in service stations, etc.



The cleaner is made of aluminum and plastic stampings. The dirt-collector bag is inside the cleaner so it will not soil clean upholstery, and is easy to empty and clean. The unit operates on air pressure of from 70 to 160 p.s.i. and consumes at 100 p.s.i. about 4½ cubic feet of air per minute. It is furnished complete with a 12-foot length of air hose ready for operation.

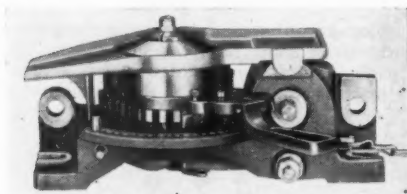
Chucking and indexing fixture

A new model H chucking and indexing fixture for use on milling machines and drill presses has been developed by J. W. Dearborn, Ansonia, Conn. This fixture embodies all of the features of the previous models D & E, in the following respects: milling to the center of the collet can be done with the smallest end mill; it can be used in the horizontal position without the need of an angle plate; long rods can be milled on the end and indexed with the fixture in this position.

Work is held by collets, in the same manner as in the previous Models D & E, which can accommodate up to and including 1" round, ¾" hexagon, and

$\frac{3}{4}$ " square. Other shapes and oversize rounds, hexagons and squares can be held by using special collets.

The makers stress that the collets positively open and close, eliminating the chance of the collets sticking in the nose piece. Work is accurately centered, even if it is a little over or under size. The collets are opened and closed automatically by the forward and backward motion of the milling machine table.



Indexing is done without loss of time when work is just back of the saw and before there is any tension on the operating chain. When using the Model

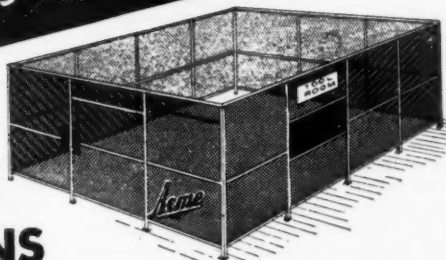
H; 1-2-3-4-6-8-12 or 24 sides or slots can be milled or holes drilled when used on a drill press. The work is automatically ejected from the collet after the last cut, by bringing the machine table back further.

The new model H is obtainable in either the plain ratchet type fixture or the ratchet and degree indexing fixture. On the latter, friction pads are put in place and a friction handle is added; both taking only seconds to put in place. With these any angles or combinations of two odd angles can be obtained with positive stops. This new fixture can be purchased as just the plain ratchet, and should demand for the degree indexing arise later, it can be sent back to the manufacturer at a minimum cost.

This new model can also be fitted with an automatic indexer which is so designed, that it becomes a complete unit, and consequently takes much less space than previous models did. Again, this indexer can be added at a later date should the demand arise.

Leaders over 50 years
Established 1899

TOOL CRIBS and PARTITIONS



Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.

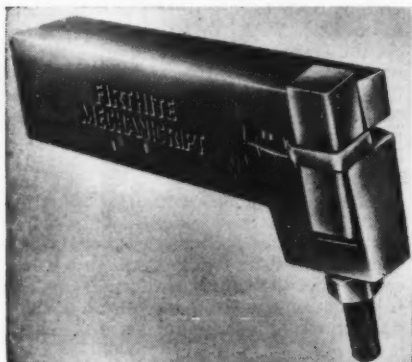
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Acme Wire & Iron Works
3519 E. CANFIELD — DETROIT 7, MICH.

Firthite insert tools redesigned

Firth Sterling Steel & Carbide Corp., McKeesport, Pa., has announced a complete re-design of their carbide-insert Mechanigript tools. M. F. Judkins, Firthite Chief Engineer said, "in order to eliminate chip erosion of the tool shank, our complete line of mechanically-held carbide tools was re-designed." The new Mechanigript tools



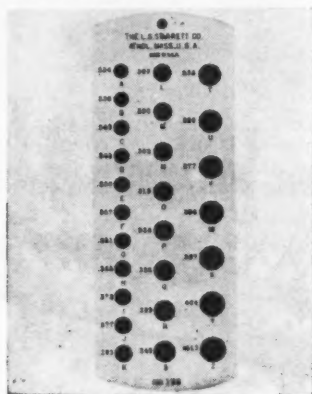
feature open facing of the carbide insert so that the chips curl against the carbide. In the former, conventional design, the steel shank nearly surrounded the carbide and even though hardened alloy tool steel was used, chip erosion was serious.

Additional features of the new Mechanigript tools include top or bottom screw adjustment of the carbide insert. This feature makes it practical to use conventional or inverted mounting of the tool, and still have easy ac-

cess for adjusting the carbide insert as it is required. All the styles of the new Mechanigript tools will accommodate carbide inserts made to the shape and size standards established by the Carbide Industry Standardization Committee.

Starrett letter size drill gage

Letter size drills can be quickly and conveniently checked with this drill gage made by The L. S. Starrett Company, Athol, Mass. Twenty-six gaging holes are provided, giving corresponding drill sizes from "A" through "Z" with decimal equivalents from .234" diameter through .413" diameter.

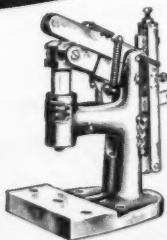


The gage is approximately 5/64" thick by 2 5/16" wide and 6 1/4" long. It has been hardened and ground, thoroughly tested after hardening, and has a bright finish.

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COLD RIVETERS

Thousands of our happy users originally started with us by submitting sample assemblies of their riveting work. Without charge we studied their particular problem, and returned the assembly properly riveted with complete analysis recommendations and quotations. It's a FREE service, that may save you time, materials and spoilage—and speedup production. Why not write us?



STAKING MACHINES

Is YOUR problem DIFFERENT? We have met and solved thousands of such problems— from cameras and meters to toys and electrical items.

Anything for staking or riveting fixed or movable joints—anything in eyeletting, grommeting, burring, pointing with platinum, tungsten, silver— whatever your problem, we can help you. No obligation. Write us.

HIGH SPEED HAMMER Co., Inc.
311 Horton St.
Rochester 21, N. Y.

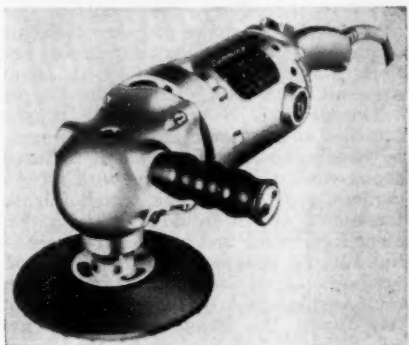
Cummins portable disc sanders

Two models of portable disc sanders for use in auto repair and body shops, welding shops, metal fabricating plants, foundries, wood-working shops, and building operations, are announced by Cummins Portable Tools, Division of Cummins-Chicago Corporation, 4740 N. Ravenswood Ave., Chicago 40, Ill.

The Model 460 (illustrated) is a heavy duty sander with a 7-inch backing pad; 18 inches in length overall, not including the pad, and weighing 14 pounds. The Model 465 is a standard duty sander with a 9-inch backing pad; measuring 18 inches without the pad, and weighing 14½ pounds.

Specifications include the following: a light, compact, cast aluminum frame, a ¾ h.p. universal type motor, either a.c. or d.c., 115 volts standard, 220 volts special; precision-cut gears of finest steel, heat treated and polished for quiet operation and long life; sealed precision ball bearings throughout; the no-load speed of the sanders is 4200

r.p.m.; switch totally enclosed, double pole toggle type; the spindle diameter is ⅝-inch, 11 thread; a gear locking pin for quick disc change is provided; a detachable handle for right or left side



mounting; 3-conductor, 7-foot rubber-covered cord, with plug; a sanding disc wrench and suspension ring to ease load on the operator are also included.

SawMore

METAL CUTTING MACHINES

If it's speed you need . . . SawMore Metal Cutting Machines are your first choice. SawMore Machines cut accurately. Operate at lowest cost.

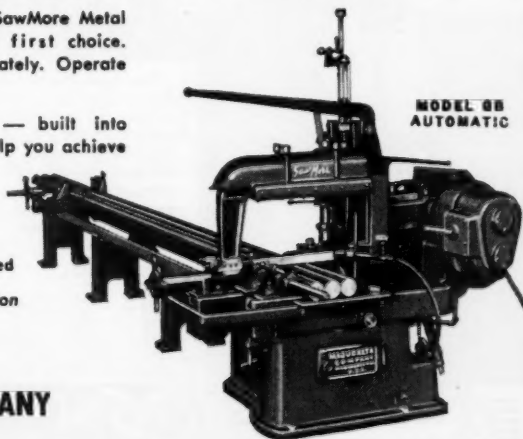
These highlight features — built into every SawMore Machine — help you achieve top production.

- Self-aligning blades
- Automatic feed
- Gears—constant mesh
- Positive compensating feed

Write for complete information
on the advantages of
SawMore Machines

MAQUOKETA COMPANY
CLINTON, IOWA

FAST METAL CUTTING
. . . MADE EASY!



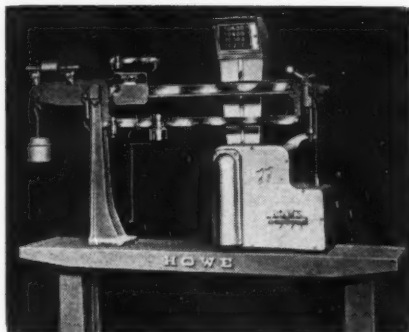
Howe automatic scale indicator

A revolutionary development in automatic scale indication has been announced by The Howe Scale Company, Rutland, Vt., with the introduction of the new Howe 77 Weightograph. A weighing accessory, the unit can be attached to any make of beam scale, or to any scale convertible to beam operation, making an old-fashioned beam scale an "automatic" of the latest type.

The Howe 77 Weightograph is simply attached to the beam shelf and connected to the beam with a rod. It features a non-protruding periscope with a convenient eye-level screen which flashes the exact weight in large, illuminated, clear figures for fast and accurate reading. It is designed with the latest methods of optical projection, which increases image brightness and contrast five times. The image is read off the mirror instead of a ground glass screen, which contributes greatly to the readability of the image under all sorts of light including daylight. The reading line length is 180 inches (15 feet).

There are no complicated parts to get

out of order in the 77 Weightograph. No adjusting of weights and poises is necessary. There is no waiting for the beam to stop oscillating (as in a beam scale) before one takes a reading. No straining of eyes at indistinct notches and figures is necessary. The unit



weighs all the load at one time and shows the full load weight reading. It can also be used for "over" and "under" readings.

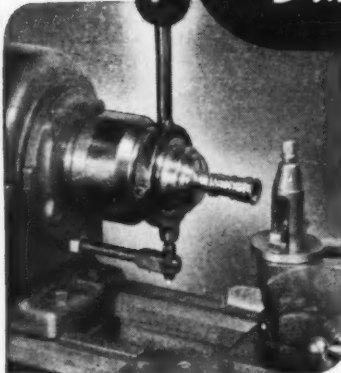
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SOMETHING
BETTER**

Your Way Ahead with the New...

DAVOS

Draw Collet Chuck

...ALL WAYS!



Illustrated is an actual lathe installation of the new Davos Collet Chuck maintaining a .001 tolerance in boring and turning. The Davos Collet Chuck utilizes both above spindle bore.
Courtesy of: S. & G. Engineering Co. Chicago, Illinois

Your production problems are over. Time and money lost on old jigs for second operation equipment is no more. Slow-ups and maintenance are cut to zero and all with greater accuracy. Yes, all this and more are yours with the new Davos Draw Collet Chuck. Super fast lever action permits continuous use without stopping to load and unload bar stock while in operation. Adaptable to all lathes, drill presses, milling machines, and grinders, the Davos uses standard round, square, hex and plain-serated type draw collets. Proven superior by actual use to all other collet chucks, the Davos is truly a fine precision instrument.

Size No.	Standard Draw Collets	Capacities Inclusive	Body Diameter	Overall Length	Approximate Weight
113	"3C"	1/64" to 1/8"	2 1/2"	3C - 2 1/2"	2 lbs.
114	"4C"	1/64" to 1/4"	2 1/2"	4C - 3"	3 1/2 lbs.
115	"5C"	1/64" to 1/2"	3 1/2"	5C - 3 1/2"	4 1/2 lbs.
116	"6C"	1/32" to 1 1/8"	4 1/2"	6C - 3 1/2"	6 1/2 lbs.
117	"7C"	1/32" to 1 1/2"	4 1/2"	7C - 3 1/2"	6 1/2 lbs.

COMPLETE INFORMATION AND PRICES UPON REQUEST. DEALERS INQUIRIES INVITED.



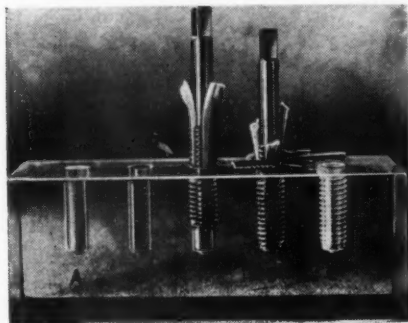
Stallion MANUFACTURING CO.
2017 N. HALSTED ST. CHICAGO 14

In the simple mechanism, a positive drive means no lost motion or backlash. The upward pull of the connecting rod swings the 77 Weightograph chart in an arc, between a stationary light and magnifying lens. The figures and graduations on the chart are magnified to about forty times their original size and reflected by means of mirrors to the mirror-type screen of the periscope.

Tap-cartridges end dead-chip interference in tapping

The Tap-Cartridge Co., 1638 Central Parkway, Cincinnati 10, Ohio has recently introduced Tap-Cartridges, hard wax inserts which eliminate the time-consuming annoyances of blind-hole tapping.

The illustration below shows the effectiveness of Tap-Cartridges: (A) The drilled hole; (B) The Tap-Cartridge inserted; (C) Hole is tapped through the Tap-Cartridge; chips are imbedded in the wax and forced up and out of hole; (D) Tap has reached the bottom of the hole without any chip interference whatsoever; (E) The operation is completed . . . effectively, efficiently.



Tap-Cartridges are designed to save time and labor in all blind-hole tapping operations. They eliminate torn threads. They are said to increase tap life five to ten times. They facilitate thread-cutting to the very bottom of the hole without any cleaning-out delays. They end, once and for all, the interference of dead chips, according to their manufacturer. Tap-Cartridges are available for tap sizes from No. 6 up, and for any depth of drilled hole.

August, 1951

Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding . . . not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work — longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA
50,000 R. P. M.

\$42⁰⁰

IN U. S. A.



Weight 12 ounces;
length 6¾ inches;
chuck size ⅜ inch.
Wheel guard removed for better illustration.

MADISON-KIPP CORP.
207 Waubesa St., Madison, Wis., U. S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

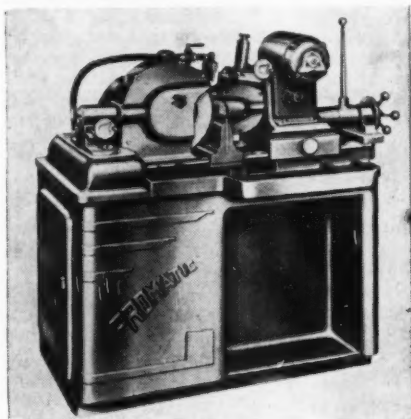
Promatic centerless grinder

The new Promatic No. 1 Centerless Grinding Machine is announced by Diversified Metal Products Co., 5125 Alcoa Ave., Los Angeles 58, Calif. This unit has been designed to meet the demand for a machine that is compact, requires small floor space, turns out a superior finish, and is provided with a generous work range and capacity, according to its manufacturers.

All castings for this machine are normalized and made of a fine grade of semi-steel with a high nickel content. The main castings have "built-in" sturdiness, and the spindle housings are both of exceptional size in order to insure vibrationless operation. The spindles themselves are of extra heavy duty alloy steel, mounted in pre-loaded precision, anti-friction bearings.

The Promatic No. 1 Grinder has a 1 1/4" maximum diameter capacity. The grinding wheel is 14" in diameter, with a 4" face; the regulating wheel is 7" in diameter, with a 4" face. The main spindle speed is 1600 r.p.m. The grinding wheel motor is a 2 h.p. unit, 1800

r.p.m., 220/440 volts, 60 cycle frequency; the regulating wheel motor is a 1/4 h.p. vari-drive type.



The variable speed drive on the regulating wheel is for instant selection of correct feed wheel speed. The regulating wheel speed is from 35 to 350

STOP DUSTS *with* DUSTKOP

22 different Dustkops, 300 cfm to 10,000 cfm available from stock

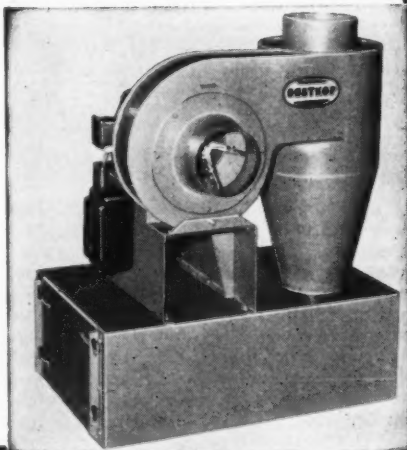
Dusts from

- Surface Grinders
- Tool Grinders
- Cutter Grinders
- Abrasive Belts, Discs
- Polishing, Buffing . . .
- . . . any industrial dusts.

Send now for new Catalog 605b.
Describe dust problem for recommendation by return mail; no obligation.

AGET-DETROIT CO.

205 Main St. Ann Arbor, Mich.



r.p.m. The diamond wheel truing devices are provided with micrometer controls. The overall length of the Pro-matic No. 1 is 48"; overall height is 54"; overall width is 35".

Standard equipment with the machine includes a built-in coolant reservoir with removable settling basin; a coolant pump with a $\frac{1}{4}$ h.p. motor and all necessary fittings; wheel guards; combination straight and contour wheel dressing device (less the diamonds and nibs); the $\frac{1}{4}$ h.p. vari-drive regulating wheel motor and controls; 3-groove main motor sheave bored for 1" shaft, with $\frac{1}{4}$ " or $\frac{1}{8}$ " keyway, and all necessary V-belts.

Metalometer with anvil attachment

Peabody Industries, Inc., 12129 Ham-ilton Ave., Highland Park 3, Mich., recently announced the development of a new model Metalometer with Peabody Anvil attachment. New features of the Metalometer include a tungsten point, micro interior finishes and trigger release mechanism.

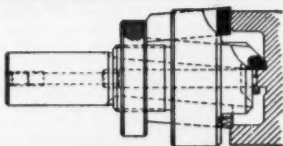


The Peabody Anvil is stated to broaden the application of testing the surface hardness of small parts. Sheet steel, gears, castings, tool bits, drills, etc., can now be accurately checked with the anvil attachment. It was reported that this useful pocket size precision hardness testing instrument is now being used by all branches of the Armed Forces.

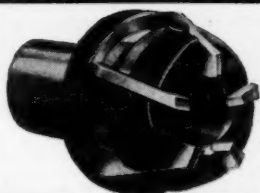
August, 1951

GENESEE

COST CUTTING MULTIPLE OPERATION TOOLS



**HOLLOW MILLS - UNDERCUTS - FACES
CHAMFERS - BORES & SPOT DRILLS**



STD. 0-2"
CAPACITIES
H.S.S. or
T.C.T. Blades
10 STYLES

ADJUSTABLE HOLLOW MILLS



STD. 1 1/4" to 4"
DIAMETERS
INTERCHANGEABLE
PILOTS H.S.S. or
T.C.T. BLADES

FACING AND COUNTERBORING TOOLS

Let our Engineering Dept. solve your Production Tool problems. Over 40 years of Know How at your disposal.

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GENESEE MFG. CO., INC.
ROCHESTER 4, N. Y.

- ADJUSTABLE HOLLOW MILLS
- FACING AND COUNTERBORING TOOLS
- SPECIAL PRODUCTION TOOLS

Smooth Harmony

Onsrud

AIR TURBINE GRINDERS

Here's power, speed, and economy to meet your needs for every type of grinder work. Such performance is unique in tools of their size and weight. Designed for easier handling, Onsrud AIR TURBINE PORTABLE GRINDERS are cheered far and wide for their light weight . . . and vibration-free operation which reduces operator-fatigue. And you'll like their low initial cost . . . and still lower operating cost.

Onsrud D-1 Grinder
75,000 RPM . . .
1/6 HP for 1/4" wheels and smaller.

Onsrud E-1 Grinder
38,000 RPM . . .
1/2 HP for 1/2" to 1" wheels

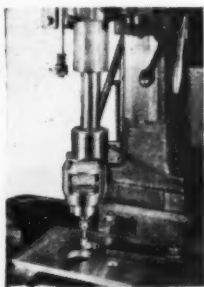
Onsrud D-1 Grinder
50,000 RPM . . .
1/4 HP for 1/4" to 1/2" wheels



Onsrud

D 1-S HOLE GRINDER

With machine tools at a premium, the Onsrud D-1-S HOLE GRINDER lets you expand the use of your present machines at little cost and at once. Precision-made for mounting as tool on jig borer, milling machine, lathe, radial drill . . . with quick, simple set-up. Onsrud Air Turbine Motor develops 1/4 HP at 50,000 RPM at 100 lbs. air pressure, for direct spindle drive to grinding wheel. Write for information today.



ONSRUD MACHINE WORKS, INC.
3900 PALMER STREET • CHICAGO 47, ILLINOIS
Distributor and Agent Inquiries Invited

New coating adds to life of soldering iron tips

"Quadri-Coat" is an exclusive new coating that eliminates re-shaping, filing and re-tinning of any size or shape soldering iron tips during the entire life of the coating. It is a recent development of Micro-Products Engineering Co., 123 Sussex Ave., Newark, N.J., and is now exclusively produced by them.

This new coating is stated by its manufacturer to save unprecedented

time and money. By actual test, "Quadri-Coat" adds 150 to 200 hours of life to the soldering iron tip. Because of the lack of maintenance and refinishing costs, it is claimed that savings in excess of \$25.00 per soldering iron can be affected during the life of a Quadri-Coated tip. "Quadri-Coat" cuts the need for frequent tip replacement in these days of short supply of copper.

Any size or shape of soldering tip sent to Micro-Products Engineering Company for Quadri-Coating is returned pre-tinned, ready for use. No

COMPACT!

More production per square foot of
BENCH SPACE!



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free circular.
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1 TON Midget BENCHMASTER

Ideal for all
low-tonnage
requirements and
assembly operations.

Other models
Available

benchmaster PUNCH PRESSES AND MILLERS

2952 West Pico Boulevard, Los Angeles 6, California

special machining or surfacing of the raw tip is required before coating. All threads and other surfaces not requiring a coating are masked by a special process.

Adamas offers bulletin on carbide rods and bushings

The Adamas Carbide Corp., Dept. BB, Harrison, N. J., has prepared a publication detailing full information for users of tungsten carbide rods and bushings.

Adamas Bulletin B-151 includes gram weight tables, standard tolerances for

unground pieces, extra charges for special forming operations and other useful data. This information will enable carbide users to estimate prices, determine most economical quantity and shape, determine grinding stock and in general find all necessary information pertaining to carbide rods and bushings.

Illustrations and examples clearly show how to use all this information. Bulletin B-151 is prepared for insertion in a ring binder. It will be furnished upon request.

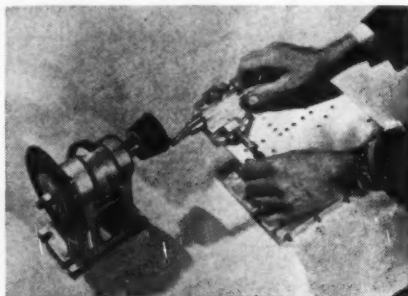
Tool sharpening attachment

A new Tool Sharpening Attachment for use with the Treyco Sharpening Fixture is announced by Treyco Products, 264 Hartford Ave., Kenmore 23, N. Y.

This new Model 500 Tool Sharpening Attachment is stated to provide easier, faster and greater precision sharpening of end mills, spot facers, reamers, metal and wood routers and similar tools, including carbide-tipped tools. The simplicity of design eliminates bulkiness and permits easier handling and adjusting, assuring more accurate tool sharpening. Included with each Treyco Tool Sharpening Attachment are 3/16", 1/4", 3/8" to 1/2" sleeves or adapters for interchanging various diameter tool shanks. An index sleeve for No. 2 Morse Taper is available.

The illustration shows the complete assembly of the Tool Sharpening Attachment clamped in the Treyco Graduated Swivel Vise which is mounted on the Treyco Model 135 Fixture and

the Treyco Dovetail Sub Base. Note that the end mill in the Treyco Tool Sharpening Attachment is fed up to the grinding wheel by the adjustable feed.



Adjustable feed, together with 6 and 8-point internal indexes, provide control of tools during the entire sharpening operation to insure the accuracy so essential to correctly sharpened tools.

The entire assembly can be made self-contained by clamping this at-

KUTMORE ADJUSTABLE HOLLOW MILLS



DESIGNED TO . . . INCREASE PRODUCTION

- Any COMBINATION of . . . Turning . . . Tapering . . . Facing . . . Chamfering . . . Trepanning in ONE PASS.
- Exclusive MICROMETER Adjustment Feature For Rapid Set-Up.
- Cutting Capacities From 1/32" To 2" Dia. in Standard Stock

WRITE FOR CATALOG 20BB

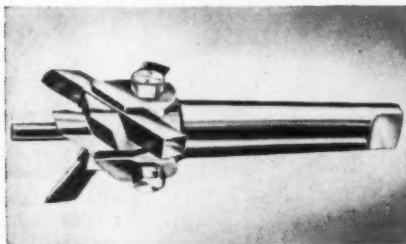
Our Engineering Department Is At Your Disposal On Your Hollow Mill Problems

CARL WIRTH & SON, INC. 1625 CLINTON AVE. NO. ROCHESTER 5, N. Y.

tachment in the Treyco Graduated Swivel Vise Model 550 on the Treyco Fixture with dovetail sub-base which is mounted on the same base as the Treyco Grinding Wheel Stand which is equipped with two motor-driven grinding wheels. By using the Model 550 Graduated Swivel Vise as a base for use with the new Model 500 Tool Sharpening Attachment, a dual purpose tool is provided. The vise can also be used for many other purposes.

Clark 3-blade adjustable hole cutters

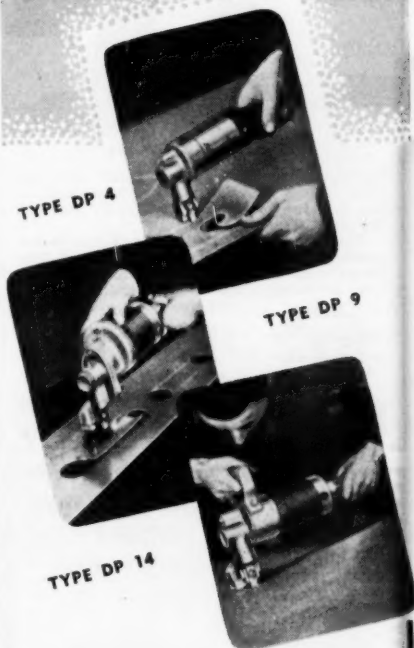
The cutting of accurate, finished holes in a single operation is now possible with the new line of 3-Blade Adjustable Hole Cutters, announced by the Robert H. Clark Co., 5330 Santa Monica Blvd., Beverly Hills, Calif. The Clark 3-Blade Adjustable Hole Cutter is stated to cut equally well on steel pipe, stainless steel, boiler plate, hard fibre, Transite and other problem materials.



The new tool is provided with replaceable cutter blades that are easy to sharpen and easy to set, according to the manufacturer. The body of the hole cutter is made of selected heat-treated steel with three high-speed steel blades set 120° apart. Pilots are removable to permit the use of lead drills.

The Clark line of Adjustable Hole Cutters has a cutting range of 5/8" to 5" diameters, and thickness capacities from thin sheets to one inch. While all models will cut clean holes through curved surfaces of pipe, tanks, cylinders and the like, the Models 4C and 5C are especially engineered for this purpose.

FLEX ELECTRIC HAND SHEARS



Cut sheet metal with ELECTRICALLY operated hand shears . . . Flex is the modern way to handle hard cutting jobs . . . easily, quickly, without fatigue. Illustrated above are 3 of the 5 models designed to do practically every cutting job in the shop. All models are designed to provide maximum visibility and ease of operation. Well built of finest materials and equipped with universal motors.

Every plant needs Flex Electric Hand Shears . . . These tools will pay for themselves many times in increased efficiency, greater accuracy and satisfied workmen.

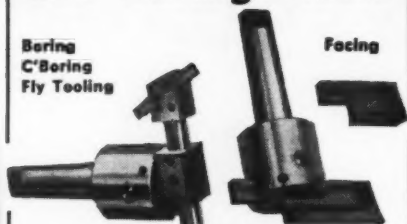


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Blind Hole Bottoming

Many enthusiastic users report that the Behr Boring Bar actually pays for itself in the first four weeks of operation. Just ask the man who uses one.

This proven patented bar is chatter proof, extremely accurate and ultra efficient. Has interchangeable blades and accessories.

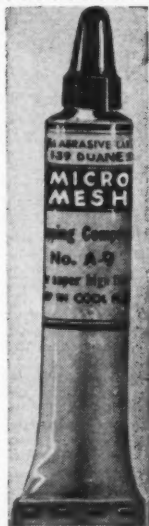
It is unequalled for versatility and efficiency.



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TOOLS, DIES,
MOLDS, ETC.**

and

**MIRROR
FINISHES**

**... IN MINUTES
INSTEAD OF HOURS**

**"MICRO-MESH"
PURE DIAMOND**

**LAPPING
COMPOUND
WILL SOLVE
YOUR**

**LAPPING
PROBLEMS**

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A-1 Abrasive Laboratories
139 DUANE STREET NEW YORK 13, N. Y.

Comparator gages accurate within .0000250"

The Troy Precision Tool Co., P. O. Box 52-22, Welshfield, Ohio, has announced its new Troy line of comparator gages, featuring three-point controlled accuracy. These new gages can be furnished in a complete line of sizes for a broad scope of diameter inspection operations. Since three strategically located contact points are utilized, the mere rotation of a shaft on the gage automatically effects inspection for out-of-round characteristics or "cloverleaf", common in shaft finishing operations. Accuracy of the new Troy gages is stated to be to within 0.0000250".



Designated Troy Series AO open comparator type, these new gages are available in a series of 21 sizes covering the range from $\frac{3}{16}$ " to $\frac{3}{4}$ " in $\frac{3}{16}$ " increments, and from $\frac{3}{4}$ " to 6" in increments of $\frac{1}{4}$ ". Each gage is adjustable within its range and can be set by means of hardened, ground and lapped setting masters having accuracy to any desired class of tolerance.

Having cast aluminum bodies, these new gages are light in weight and easily handled for on-the-machine inspection, or they can be furnished with a cast-iron mounting base to facilitate production inspection. The cemented carbide inserts utilized are ground and

lapped to gage block parallel, and they are re-workable for the life of the carbide. Sapphire-tipped inserts can be supplied for use on highly abrasive or soft, easily marred materials.

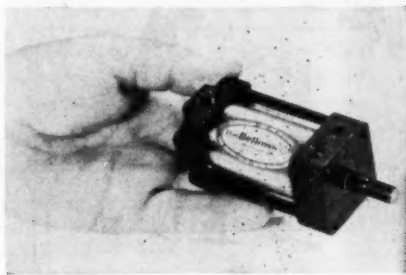
Universal mounting air cylinder

A 1½" bore, 1" stroke, single-acting, spring return small air cylinder has been added to the line of "Controlled-Air-Power" devices manufactured by The Bellows Company, 222 W. Market St., Akron 9, Ohio. The new unit was developed primarily for use in jig and fixture operations and for parts positioning and ejection.

Trade-named the Han-D-Air Cylinder, it has a power factor of 1:1, developing a thrust approximately equal to the applied air pressure. Compact in design (4½" long by 1½" high by 1½" wide) the Han-D-Air Cylinder can be mounted in practically any posi-

tion: front flange, rear flange, side, foot, or front pivot. The 5/16" diameter piston rod has ½" of threaded end to simplify installation.

While simple in design, the cylinder's



construction is unusually sturdy, including a heavy gauge pump finish brass cylinder, ⅝" thick aluminum alloy heads, oil resistant piston cup, and heavy tension-tested spring.

O.B.I. PRESS

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**15" HEAVY
 DUTY PRODUCTION MODELS
 STANDARD IN 1 TO 6 SPINDLES**

Dozens of exclusive Darra-James
 design and engineering features.
 Investigate this complete line
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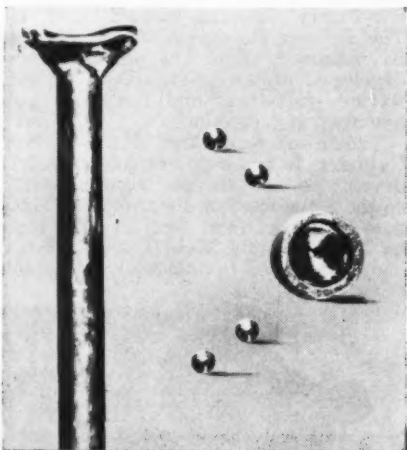
**WRITE FOR BULLETIN D.P. 51 —
 SPECIFICATIONS AND PRICES —
 NO OBLIGATION.**

toolcraft
**CORPORATION
 SPRINGFIELD, MASS., U.S.A.**



Ball bearings have 1.5 mm. o.d.

The illustration below shows a highly magnified portion of a common pin; next to it is the smallest pivot ball bearing made in America. This bearing is manufactured by Miniature Precision Bearings, Inc., Keene, New Hampshire. The new ball bearing has an outside diameter of only 1.5 millimeters. It is the latest addition to the company's series of miniature pivot bearings.



Diameter tolerance is held to plus zero and minus .0002". To achieve these tolerances, measurements are made with instruments accurate to 20 millionths of an inch. The pivot shaft holds the balls in place. The raceway wall itself is designed so that its mass occurs at points of greatest strain, permitting relatively heavy loads under severe conditions of shock and vibration. These miniature ball bearings are said to be rapidly replacing jewel bearings for instruments used under such conditions.

Since 1919, the MPB line has been expanded to more than 70 types and sizes including many styles of radial, pivot, thrust and other ball bearings ranging from $\frac{3}{16}$ " down to this new 1.5 mm. size. Tolerances are measured in ten thousandths. (One ten-thousandth compares to one inch as six and one-third inches compares to one mile.)

IMMEDIATE DELIVERY! TRISON IMPROVED TURRET TOOL POSTS

Specifications

Model	Lathe Swing	Tool Size	Specifications	Lathe Center	Price
22½S	6" - 12"	¼" to ½"	4 Tool—12 Position 2 ½" sq. x 1 ½" thick	Height for both	\$27.50
Hex.	6" - 12"	¼" to ½"	6 Tool—12 Position 2 ½" hex. x 1 ½" thick	11/16 to 1-5/16	29.00



Suitable 9" S.B., 10" Atlas, 10" Logan Bench Lathes. Precision made to highest standards and fully guaranteed to give complete satisfaction.

A COMPLETE LINE OF MACHINE SHOP EQUIPMENT—Send for Catalog.

CENTER TOOL CO., 153 CENTRE ST., NEW YORK 13

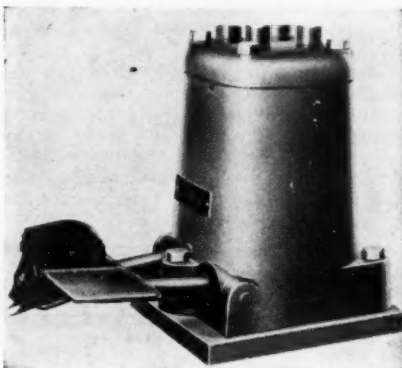
Foot-operated air valve

A new line of foot-operated air valves, designated as "Quick-As-Wink," has been introduced by C. B. Hunt & Son, Inc., 2200 E. Pershing Ave., Salem, Ohio.

Quick-As-Wink foot operated valves permit hammers, shears, presses, hopper gates, furnace doors and other types of air operated machinery and equipment to be fully controlled simply by foot pressure on a pedal. Consequently, the operator has both hands free to handle work—speeding production and cutting costs.

The valving mechanism has a stainless steel body and push-pull rods, brass sleeves, self-sealing U-shaped packers and other refinements found only in Quick-As-Wink construction. All operating parts are fully enclosed against the entrance of dust and dirt, and protected within a cast iron housing, assuring long, efficient, trouble-free operation. There is no metal to metal seating. All parts are in pressure balance, eliminating creeping and

crawling. Pipe connections are conveniently made through the top of the housing.

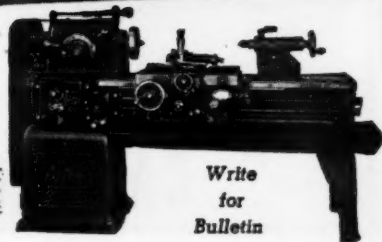


The valves are available in ¾" to 1" sizes, 3-way, 4-way, neutral position and regular actions. Single and two pedal designs are provided for air to 150 p.s.i. and 150° F.

CARROLL and JAMIESON

- 16" Lathe
- 12 Speed Geared Head
- Motor Drive Timken Mounted Spindle
- Modern Design
- Liberal Dimensions

Carroll & Jamieson Machine Tool Co.
BATAVIA, OHIO, U.S.A.



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Bulletin

Removable insert Face mill

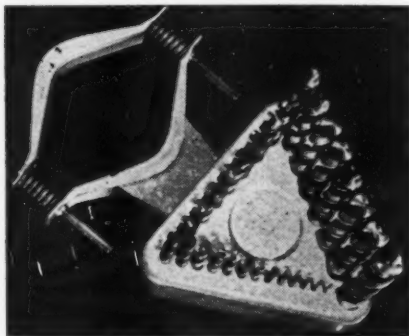
The Nelco Tool Company, Manchester, Conn., manufacturers of carbide tools, announces a new, removable insert face mill. This tool has been designed with many exclusive features, including fewer parts, a heavier, more rigid body, a positive locking action, and heat treated tool steel, carbide tipped blades. This versatile cutter is recommended for milling cast iron, steel, aluminum, brass and bronze and is stated to produce an exceptionally fine finish at high table feeds.

Indexing drill selector

A new Indexing Drill Selector for fractional size drills from $\frac{1}{16}$ " to $\frac{1}{2}$ ", has just been announced by the W. A. Horejsi Company, 2001 James Ave., No., Minneapolis 11, Minn.

Designed for mounting either on the drill press column or on the wall, the Indexing Drill Selector provides a convenient means of keeping drills handy for quick selection of the proper size. Drill sizes are plainly marked on the side of the case which revolves on the

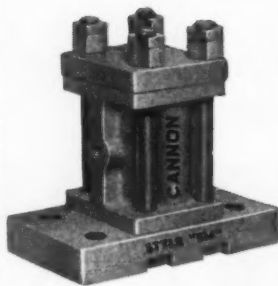
supporting bracket. The mounting clamp provided will fit any column from 2" to 4" in diameter or it may be fastened to a wall or any flat surface.



According to the manufacturer, the new unit is ideally suited for machine shops and tool and die shops, as well as manufacturing establishments where a single drill press is employed in a variety of drilling jobs requiring ready accessibility to drills of different sizes.

CANNON *Quiet Type* VIBRATORS

PAT. PEND.



Available in $1\frac{1}{4}$ " to 5" piston sizes—12 lbs. to 325 lbs.

Have just what you've been looking for—effective vibration, with less noise and no accessive strain on the vibrator.

There is no metal to metal pounding . . . no springs . . . no din . . . just a quiet, efficient unit which has proved itself in foundries and other industries from coast to coast. Send today for your catalog and prices on Cannon equipment, which do your job better and for less. Write now!

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1110 Power Ave., Cleveland 14, Ohio

MARVECO *Live Centers*



- HEAVY DUTY
- LONG LIFE
- HIGH SPEED

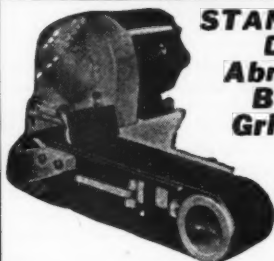
MARVECO is the time-tested live center with unlimited capacity—50 pounds to 50 tons—guaranteed to outperform and outlast any other live center. You can depend on MARVECO for trouble-free production.

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SEND US YOUR CENTER PROBLEMS

MARVEL TOOL & MACHINE CO.

1096 North River Road • St. Clair, Michigan



STANDARD D-4 Abrasive Band Grinder

Famous
for
Stamina

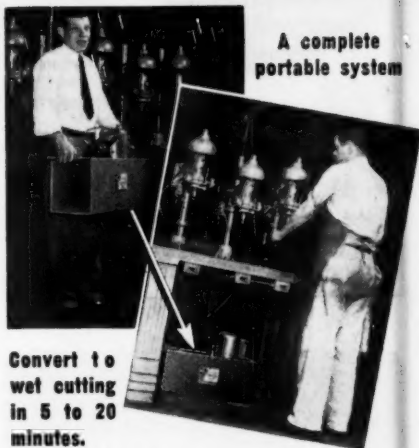
This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW MANUAL ON FINISHING—WRITE TODAY

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Get more production from your machines with GRAYMILLS Pumps and Coolant Systems



Convert to
wet cutting
in 5 to 20
minutes.

Graymills Coolant systems and pumps increase cutting speeds, improve work quality . . . tool life.

Most industrial distributors stock standard units.



Sturdy high pressure gear models . . . smooth high volume centrifugal types in 1/25 to 70 g.p.m., with tank capacities from 5 to 38 gals. Also immersion type centrifugal pump and motor units.

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THE TAPERED
SEAT ASSURES
ACCURACY OF
+ .0001

Manufactured in
all tapers. 1 to
6 MT in stock.
Special shanks
and points
made to order.

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standard.

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ROYAL PRODUCTS
87 UNION ST. MINEOLA, N.Y.

For 50 Years
MOLINE "HOLE-HOG"
MACHINE TOOLS
HAVE SERVED
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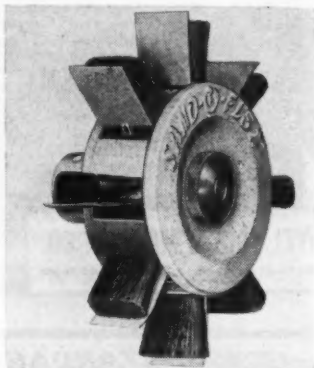


**DRILLING - BORING -
HONING - TAPPING
and SPECIAL MACHINES**

MOLINE TOOL COMPANY
102 20th St. MOLINE, ILLINOIS

Brush-backed sanding wheel

An improved sanding wheel, known as Sand-O-Flex Model 350R is now in production at Merit Products, Inc., 4023 Irving Place, Culver City, Calif. The new unit is a brush-backed sanding device that may be attached to any rotating shaft for sanding and finishing curved and contoured surfaces. This model is particularly recommended for use on portable electric drills and flexible shafts because of its light weight and compactness.



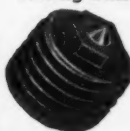
The cover has been concaved to allow the knurled nut, which holds the cover in place, to be inset flush with the face of the tool, thus reducing the bulk and increasing the sander's efficiency and maneuverability when being used portably. Weight has been decreased by four ounces for easier handling. Loading of the refill cartridge has been simplified. Overall diameter is 5½".

The sander has eight replaceable brushes fastened to its perimeter. These brushes back up and "cushion" eight strands of abrasive cloth, 1" wide, which unwind from a single core. As the wheel rotates, the abrasive strips mold themselves to the contour of the work piece, with a "paint-brush" action and finish wood, metals, or other material requiring an abrasive operation. When wheel rotates at normal speed, the wheel delivers 14,000 sanding strokes per minute. As abrasive wears it is cut or torn off and new abrasive is fed out from the central magazine.



A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{1}{8}$ " to 1" diameters. Send for pricelist.

HEIMANN MFG. CO.

332 Lincoln Ave.

Urbana, Ohio



WHO

looks more like a busy, little beaver than a wise, old owl these days. But WHO* is still—

*Wm. H. Ottemiller**
of YORK, PA.

Even though the need for our precision, "milled-from-the-bar" screw machine products has us virtually snowed under—we invite inquiries from those of you who must have "the best."

KOENIG



**TWO SEAT
VERNIER
DEPTH
GAUGE**

Of particular design, easy and quickly measures distance of projections, depth of holes, etc.

Its features:

Solid head, hardened ground and lapped.

Two Verniers, to obtain otherwise difficult measurements.

Compact design to permit the use of 1" scales.

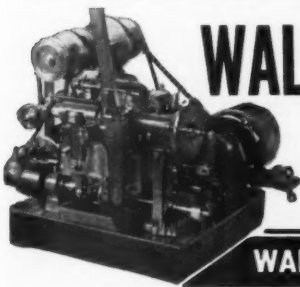
Accurate machine divided graduations.

Furnished with case in 1" to 12" size scales — 18" and 24" also available. Prices on application.

No toolroom crib or mechanic can afford to be without one.

WM. A. KOENIG

134 Ferry St. Troy, N. Y.
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PINION AND GEAR CUTTING

Machines

These machines are finished according to the work to be done. Send samples or dimensioned drawings and tell us about the cutting qualities of the material and probable production per week or month. Then wait for our reply with bulletin.

WALTHAM MACHINE WORKS

**WALTHAM 34
MASSACHUSETTS**

Lightweight pneumatic screwdriver

The new Desoutter high-speed miniature screwdriver, recently introduced by Newage International, Inc., 235 E. 42nd St., New York 17, N. Y., is shorter than a fountain pen and less than an inch in diameter. This new tool brings power assembly to jobs which were hitherto thought to be too small or delicate for such methods. The small size, light weight (8 oz.), and adjustable high speed output of the Desoutter screwdriver is particularly suited to assembly line work in instrument making, radio, radar and television assembly, telephone and instrument making, as well as the manufacture of small electrical appliances.

The high speed rotor-type motor runs at 14,000 r.p.m. It is coupled directly through the clutch to the screwdriver bit, thus affording the maximum possible operating speed. Its automatic on-off control protects the screw head from damage.

In operation, the tool is simply ap-

plied to the screw head. Air is automatically switched on when the bit comes in contact with the screw head, and is switched off when the pressure is released. The air hose is of a new, light, strong and flexible construction, to assure ease of handling, less operator fatigue.



The pressure-reducing valve is set for the required tension, guaranteeing that all screws and nuts will be driven to uniform tightness as the tension of the resistance of the screw to further tightening controls the impact-type clutch.

for greater **RIGIDITY**
more **ACCURATE** cuts

use
CRITERION



**BORING
HEADS**



A full line of adjustable boring heads and bars now available. Heads 1 1/2" to 7" dia. Carbide or high speed bars 3/8" to 1 1/4" dia. Lead screws ground **AFTER HARDENING**. Ample bearing surface, heat treated parts, interchangeable shanks. Criterion tools are the criterion. Write for free catalog and costs.

9312 SANTA MONICA BLVD. • BEVERLY HILLS, CALIF.

All moving parts of nickel-chrome-molybdenum steel, heat treated. All bearings are ball or roller. The design is such that the tool will operate continuously over very long periods with no more attention than periodically filling the air line lubricator. In starting, the vanes of the rotor-type motor are blown out by air pressure as soon as the tool is switched on, making instant starting automatic and positive.

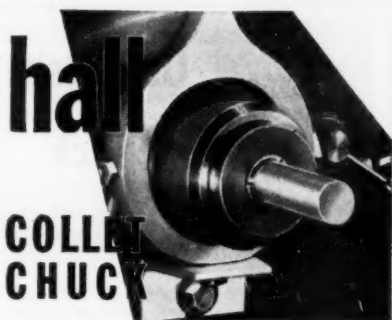
Machinists' and toolmakers' layout fluid

A useful Layout Fluid has recently been introduced by Dayton Rogers Manufacturing Co., 2835 13th Ave., So., Minneapolis 7, Minn. This preparation is said to have a considerable advantage over the old copper sulphate method, since the scribed lines make a pronounced contrast against the dark background, relieving eye-strain, and allowing the operator to work accurately and easily to the desired layout.



This compound may be used to advantage in layout work on brass, aluminum, stainless steel, tin, copper, etc. With the use of the die blue Layout Fluid, the operator does not need to polish the surface of the material to be scribed; he simply wipes the surface fairly clean, and brushes the Layout Fluid on. The compound dries instantly. It is highly recommended for machinists and toolmakers, die, metal pattern and model makers, sheet metal workers, oxy-acetylene cutting, etc.

The manufacturer announces two new sizes of containers of the Layout Fluid, because of popular demand; both are supplied with a combination large brush-in-cup. The pint size is supplied with a $\frac{3}{4}$ " brush, and the quart size has a $1\frac{1}{2}$ " brush.



SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007 — without adjustments . . . no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;

1-inch capacity, \$95

Round, square or hex collets, plain-serrated

HALL MANUFACTURING COMPANY

622 Tularosa Dr., Dept. A, Los Angeles 26, Cal.





Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
2. Reel is adjustable to suit height of Press.
3. Reel can be inclined to any position.

Stock Reel with plain bearing \$55.00

Stock Reel with roller bearing \$65.00

Manufactured By

John Humm Safety Equipment Co.
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- SQUARE BLADES Easily Replaced.
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Pocket-size hardness tester

A light-weight, precision-made hardness tester has been introduced by the A. H. Company, Brighton, Mich. This device is said to be a radical departure from testers now in use. Approximately the size of a slide rule ($8\frac{3}{4}" \times 1\frac{1}{2}" \times \frac{1}{2}"$), the A. H. Tester can be conveniently available wherever accurate comparative checking or quality control is desired. It obtains consistently precise hardness readings based on the surface elasticity of the objects tested.



Its operation is simple, and readings can be obtained by anyone, on the job. A simple hammer with a non-elastic carboloy tip is allowed to drop a determined distance to rebound to the reading position. Conversion charts accompany the A. H. Tester so that comparative Rockwell or Brinnell readings can be quickly obtained. The tester can be used on the production line or in quality spot-checks for comparative Go and No Go testing where desired.

This self-contained, accurate tester provides a simple control method for production line, stock room, receiving room, laboratory, engineering department, inspection or any locality where quick, accurate tests are wanted.

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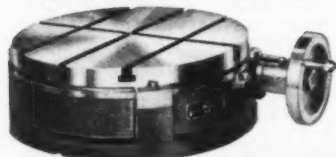
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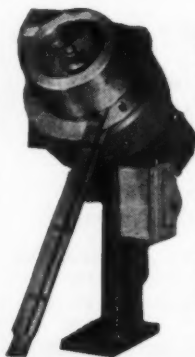
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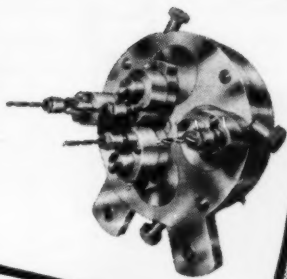
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SIZES: 0 to 1 1/2"
3 1/2" to 12"
NO. 2 M.T. Socket Capacity

ERRINGTON Mechanical Laboratory, Inc.

Established 1891

Main Office and Plant: **STATEN ISLAND 4, NEW YORK**

Delta hydraulic drill unit

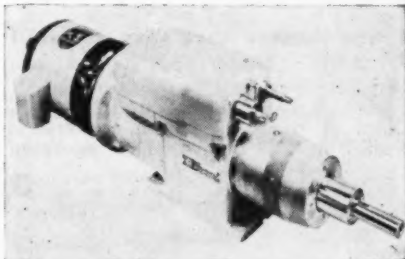
The Delta Power Tool Division, Rockwell Manufacturing Co., 605G E. Vienna Ave., Milwaukee 1, Wis., is now in full production on its model No. 19-400 Air-Powered Hydraulic Drill Unit.

The new Delta Drill Unit is designed for heavy duty high production work on drilling, reaming, tapping, centering, chamfering, spot facing, etc. The Air Powered Hydraulic Circuit derives its thrust from the plant compressed air supply and its control from a sealed hydraulic system. The spindle is driven by an electric motor either directly, through a gear train, or by v-belts. The unit may be mounted in any position because of its sealed unit construction.

Features of the unit include quick setup, accurate settings, fast traverses, and built-in switches for interlocking drill units to other elements such as index tables or other drill units.

The adjustments for rapid approach to the work, feed, and final depth, are

grouped at the front of the unit. The length of the approach and total strokes are controlled by positive stops which make it possible to approach the work to within .005" at five inches per second



rapid traverse and to control final depth to within .0005". The feed is infinitely variable from 0 to 50" per minute. At the end of the stroke, the unit returns at 4" per second. The full stroke is four inches.

The drill units may also be equipped to feed on the back stroke for tapping, threading, and back-spot facing. Tapp-

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HUPPERT MODEL 11 FURNACE

Years of low-cost operation on heaviest schedules in tool and die shops, and laboratories have dictated these features for your economy. Huppert Automatic Temperature Control for accuracy to 2000° F.—Huppert Multi-Insulation, Heavy-duty Kanthal elements, and fully enclosed contacts. Counterweighted, tight-sealing door. I.D. 8"x6"x12". 220 V *AC, 4½ KW max. load.

Model 11ACB - \$380.00 Complete

Model 11 (Without Temp. Control) - \$240.00

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Model 12	8"x8"x12"	2000°	6		\$320.00
Model 12A	8"x8"x18"	2000°	6		\$400.00
					PRICE WITH TEMP. CONTROL
Model 12ACB	(Same specifications as Model 12)				\$430.00
Model 12A-ACB	(Same specifications as Model 12A)				\$560.00

All models can be supplied for 2300° F. operation for small additional cost.

WRITE FOR DETAILS

K. H. HUPPERT COMPANY

6845 Cottage Grove Avenue Chicago 37, Illinois
Manufacturers of Electrical Furnaces and Ovens

ing and threading are done by means of floating tap holders. The model No. 19-400 Air Hydraulic Drill Unit will take from ¾ to 1½ h.p. motors. It will take up to 5/8" drill in steel.

Trade Master hack saw and drill

The Trade Master Unit is a combination hack saw and drill introduced by The P. & L. Products Co., Greenville, Ohio. A flip of a button converts it from a drill to a saw. When operated

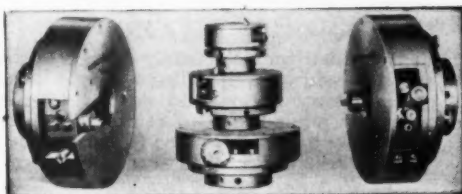


as a saw, regular hack saw blades may be used, or the manufacturer can furnish blades prepared for any special material or work. When operated as a drill, the saw guide is turned down, then turn into position and insert drill. The unit takes up to 1/4" drill.

The Trade Master also has various other uses. A flex sander can be attached in place of the saw. A file can be inserted, and it can be used as a filing machine when rigidly supported. When properly mounted, the Trade Master can be used either as a drill press or a jig saw, and still be portable when required. The unit is fast cutting, light weight, and compact.

Denison surge damping valve

New Surge Damping Valves, said to eliminate excessive shock in high pressure hydraulic systems, have been developed by The Denison Engineering Co., 1184 Dublin Road, Columbus 16, Ohio. The valves are an individual unit, universally adaptable to any hydraulic circuit. Both aviation and industrial



MUMMERT-DIXON FACING HEADS

with Automatic Feed

One-way Tool Feed — 6, 9 and 10" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes. Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

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How TO REDUCE REJECTS!



Spoilage losses in tapping and reaming, due to misalignment of the work with the spindle, can be reduced surprisingly, many find, by simply changing over to a different type of tool holder — a Ziegler Floating Holder—because the Ziegler automatically compensates for alignment inaccuracies of as much as 1/32" radius or 1/16" diameter. Try it and see!

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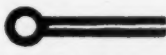
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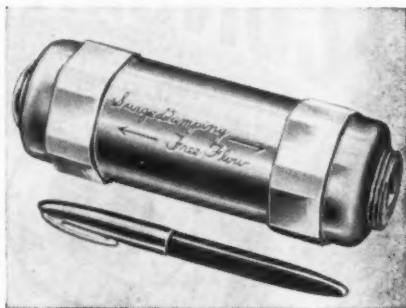
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THE GRANT MFG. & MACHINE CO.
C E Station, Bridgeport 5, Conn.

models are available in a range of sizes for wide application.

Small and compactly designed, they are said to be installed as easily as any ordinary fitting and do not interfere with other functions of the circuit. The valve has been proved in test setups to prevent shock from occurring, rather than simply absorb hydraulic surge and consequent shock.

Possible applications include installation at the ports of 4-way valves; in a cylinder circuit as an automatic decompression valve; in any line leading from an accumulator; and in other locations.



Principle of operation of the valve approaches uniform acceleration. This assures smooth, shockless action in the circuit, regardless of pressure used. The valve adjusts itself automatically to any working pressure, requires only a fraction of a second to act, and cannot slow down cycle time. It prevents the damaging vibrations caused by sudden starting, or reversing flow. A normally closed valve, it gradually opens when pressure is applied to the inlet side. When the flow is interrupted, the valve quickly resets and is ready for the next operation. It requires no manual adjustments and has no external drain. Being small in size and light in weight, the valve has its simplified component parts compactly arranged. The spool inside is normally held closed by a spring to prevent flow from inlet to outlet.

The Denison Surge Damping Valve will open at a slower rate of speed at high pressures than at low pressures, when the valve is subjected to sudden surges of fluid.

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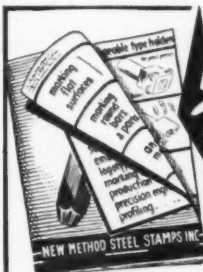
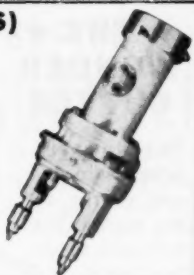
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In stock for immediate delivery.

No. OAD min. .65" max. 3.4" — 1/8" drill
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 Heads with fixed spindles designed and built
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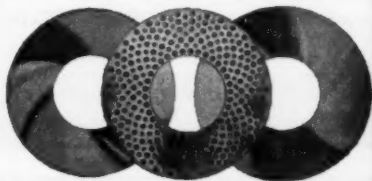
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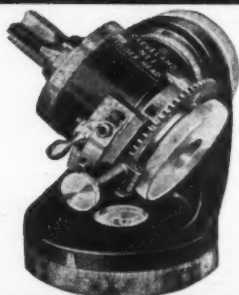
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Holds $\frac{1}{16}$ " up to $1\frac{1}{2}$ " Tools
5C or 1AM Collets and Brown & Sharpe or Morse Taper. Will adjust to any compound angle.

GRINDERS & FIXTURES INC.

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Cro-Hone pressure blast unit

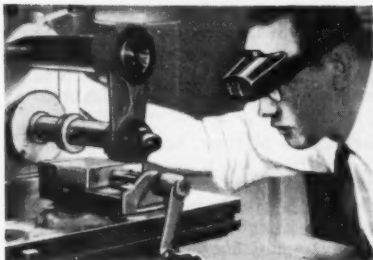
A new metal-working procedure in the fields of high-speed, accurate deburring, descaling, stock removal and general surface finishing is now available for industrial application through the use of the Cro-Hone Pressure-Blast, a self-contained, easily installed wet-blaster manufactured by the Cro-Plate Co., Inc., 747 Windsor St., Hartford 5, Conn.



The Cro-Hone Pressure-Blast uses the basic technique of wet-blasting to increased advantage by increasing the speed of the abrasive slurry as it is forced against the work. Conventional speeds have been trebled. The power and accuracy of the abrasive blast can best be judged by the fact that a perfect $\frac{3}{16}$ " diameter hole can be bored in a piece of $\frac{1}{2}$ " thick plate glass in 38 seconds. Operating at normal shop pressures of from 80 to 120 p.s.i., the fundamental formula of $E=KV^2$ (work-produced or energy varies directly as the square of the velocity) accounts for the effectiveness of the unit.

In operation, the work to be finished is inserted in the 30"x30" cabinet through the front hand-holes or side doors. Both entrances are fitted with splash-proof guards which allow leak-

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EDROY PRODUCTS CO.

480 Lexington Ave.,
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age-free installation. Mechanical, knee actuating valves and controls are located within reach at the front of the cabinet, and a large, clear-view window enables either the tall or short operator to watch progress of the work.

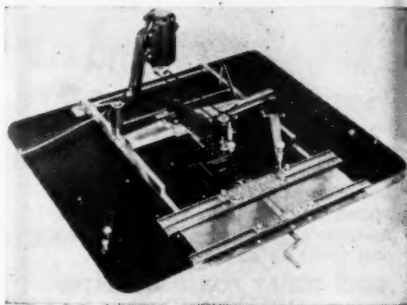
The Cro-Hone Pressure-Blast is constructed of type No. 304 stainless steel, and copper tubing is used throughout to avoid corrosion in the equipment and the work produced.

Machine engraves on 25" widths

An enlarged capacity engraving machine capable of engraving on units up to 25" in width and to any length, has just been announced by New Hermes, Inc., 13-19 University Place, New York 3, New York. The machine, the newest addition to their line of engraving equipment will, according to the manufacturer, handle greater sizes than any others on the market. It is suitable for engraving names, numbers and instructions on dials, nameplates, and panels covering from the smallest area up to extra-large dimensions.

The machine is stated to be equally efficient for engraving on metal or plastic.

The Engravograph works on the pantograph principle and is claimed to be the only portable unit made which is capable of engraving 15 different sizes from one template. It is also



capable of doing multiline engraving in one set-up using adjustable copy-holding slides.

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Two spindle or single spindle

Speed and more speed in the production of interchangeable parts requiring milling of any contour or outline is yours in the MOREY 12M. Provision for increased clearance between spindles and table.

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PORTABLE ELEVATING TABLE



**Saves
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Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

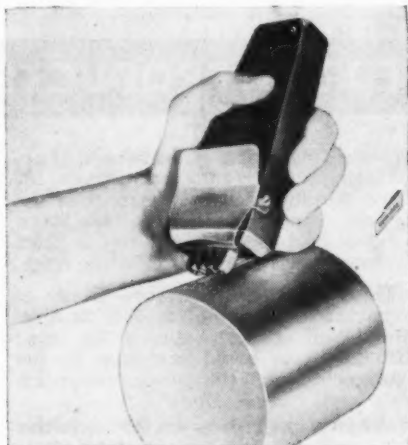
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CATALOG NO. 2**

MIDWEST TOOL & ENG. CO.
112 WEBSTER ST., DAYTON, OHIO

Numbering tool for convex surfaces

A new numbering tool using ordinary straight line flat surface marking type with an insert segment, thereby becoming a tool for marking convex surfaces, is offered by The Acromark Company, 15 Morrell St., Elizabeth 4, N. J.

Each piece of type, being of standard body width, is easily removed from the holder, but due to the segment piece blank that is placed between each piece of type, a curvature is obtained conforming to the surface being marked. A formed metal plate with a flange on it, held taut by a coil spring, locks each piece of type and each segment spacer in place firmly, but allows removal and interchanging quickly and simply by thumb pressure on this formed spring pressure clip.



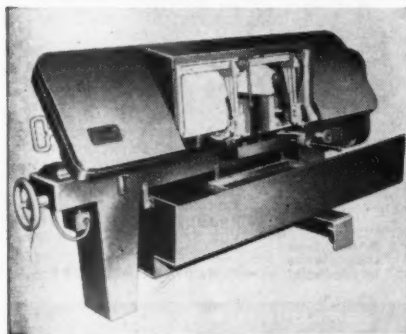
The illustration above shows the holder in a hand style unit. It is also provided in press styles having a shank for standard ram sizes. The standard sizes of this numbering tool are for 4, 6, 8, and 10-piece capacities of type, in sizes ranging in 16ths and 32nds from 1/16" to 1/4". Other sizes can be provided on order, but are not carried in stock.

The holder and type are designated as Hercules Concave Holders and Hercules "Shoulder Style" Type with concave marking segment blanks. The

holder is made from shock resistant tool steel in one piece, except for the clip which locks the type in place, and the coil spring which is held in position by a proper fitting hole in the side of the holder. The holder itself, in the hand style, is shaped for convenient hand use and the tempered stainless steel clip is scientifically mounted for maximum life.

Kalamazoo metal-cutting band saw

A new metal-cutting band saw—the Kalamazoo “1220”—is the latest addition to the line manufactured by the Kalamazoo Tank and Silo Co., 421 Harrison St., Kalamazoo, Mich. This tool is said to provide fast, accurate production cutting of metals up to 12" x 20" flat, 12" and over in round stock. It is available both in standard or coolant-equipped models.



Construction features reported by the manufacturer include its exceptionally rugged construction to maintain precision. Four cutting speeds of from 61 to 259 f.p.m. are provided. A unique dash-pot mechanism insures controlled, constant pressure during the complete cut. A swivel left type 45° vise permits easier adjustment of cutting angles, quick blade mounting from the top and an unobstructed view of the cutting operation.

The new Kalamazoo “1220” includes as standard equipment a 1 h.p., 220/440/60/3 motor and stock stop bar. The entire unit is 87" long, 26" wide, and is 25½" high to the bed.

EASY READING

Rivett transparent packaging permits inspection of collet style and size without removal from carton. A time-saving feature eliminating stock room headaches.

Rivett Draw-In Collets are checked 25 times against master gauges! Work is guaranteed to run “dead true” at the collet mouth. Stocked in all standard styles.



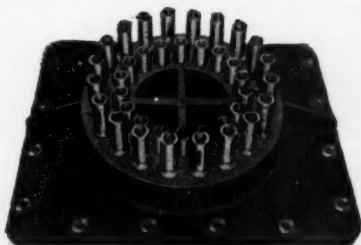
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LATHE & GRINDER, Inc.

Brighton 35, Boston, Mass.

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RELY ON RIVETT, The Master Craftsman's Master Tools



Pictured: a 38-Spindle Heavy-Duty Drill Head

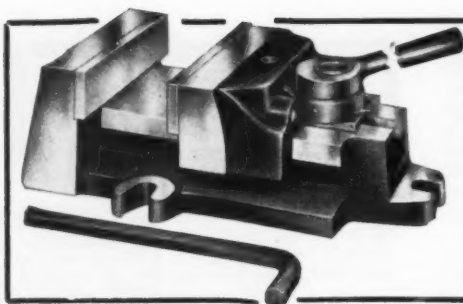
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PLUNKET QUICK ACTION VISE for DRILL PRESS or MILLING MACHINE

Designed for production work, using an eccentric motion to apply pressure to jaws. Eccentric motion moves jaws 5/16".

Size Net Price

6" jaws, 1 1/2" deep, opens 4" \$69.30

Pressure between jaws, with handle furnished, 2200 lbs. Net weight 35 lbs.

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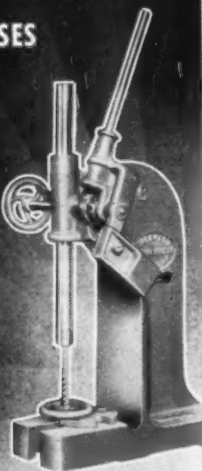
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• WIDE RANGE TAP CAPACITY
No. 1 FRICTION DRIVE TAPPER

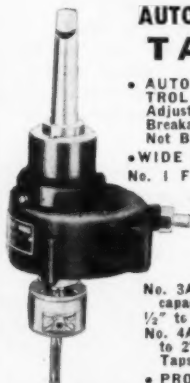
—capacity No. 2-56 to 3/8" in Steel
1/2" in Aluminum.
No. 2B POSITIVE TAPPER—capacity 3/8" to 1/2" in Steel

No. 3A POSITIVE TAPPER—capacity 1/2" to 1 1/4" in Steel, 1/2" to 3/4" Pipe Taps.

No. 4A TAPPER—Capacity 3/4" to 2" in Steel including Pipe Taps.

• PRODUCTION THREADERS with Round Split Button Acorn Dies

• IMMEDIATE DELIVERY



Price from \$48.00. Write for Bulletin.

THRIFTMASTER PRODUCTS CORPORATION

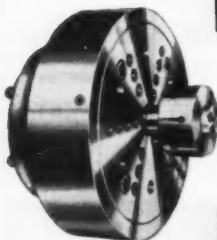
Division of Thomson Industries, Inc.

1030 N. PLUM STREET, LANCASTER, PA.

STANDARD UNIVERSAL ADJUSTABLE AND SPECIAL FIXED CENTER DRILLHEADS

SPEEDGRIP — FOR ALL INTERNAL CHUCKING

Here's the answer to fast, accurate and economical machining. SPEEDGRIP CHUCKS are being used in ever increasing quantities in plants everywhere. Write today for information on how SPEEDGRIP can speed your second operation work. Layouts will be made and prices quoted from blueprints. No obligation.



SPEEDGRIP CHUCK INC. 822 N. WARD STREET
ELKHART, INDIANA

Nolan production milling machine

Nolan Machinery Co., Rome, N. Y., announces a new Production Milling Machine of exceptionally sturdy construction, engineered to maintain its accuracy under hard usage. The unit's simplicity is stated to adapt it to profitable use by unskilled operators.



The machine is designed to use motors up to 2 h.p. The spindle accommodates No. 40 American Standard arbors. Hand lever feed is standard for this machine; screw feed and automatic feeds are also available.

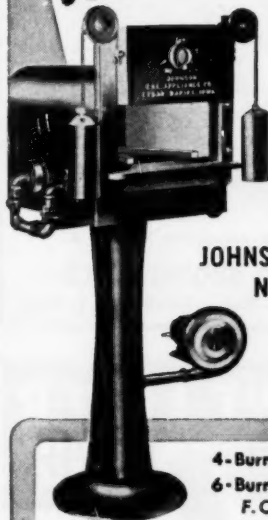
The 6"x20" table of this machine has a working surface of 4"x16". The longitudinal feed of the table either with hand lever or screw power is 12"; the feed with automatic feed is 8". A 1/2" T-slot is provided in the table.

The milling head has a vertical range of 5"; it will accommodate a cutter diameter of 7"; the overarm diameter is 2", and lateral adjustment of the quill is also 2".

Speeds are provided by one set of single groove pulleys for any standard ratio of from 1:1 to 1:6. Special intermediate drive for lower speeds or multi-step cone pulleys are available as extra equipment.

August, 1951

**TURN THE HEAT
on HIGH SPEED STEELS
Quick Acting
JOHNSON FURNACES**



**JOHNSON Hi-Speed
No. 130A**

4-Burner \$295

6-Burner \$325

F. O. B. Factory

High Uniform Temperatures at LOW COST

Quick Acting JOHNSON No. 130A is available in two temperature ranges. 4-Burner unit is for steels requiring 1400—2350° F., and 6-Burner unit for 1800—2400° F. Powerful, efficient burners fire under hearth assuring fast, uniform heat. Save time and gas. Easily regulated. Firebox 7x13x16 1/2 lined with high temperature insulating refractory. Complete, ready for action with Carbofrax Hearth, G. E. Motor and Johnson Blower. Order Today!

Write for Complete Catalog

Johnson Gas Appliance Co.

570 E Ave. N. W., Cedar Rapids, Ia.

RIVETING?



use LINLEY Noiseless Riveting Machines

Sturdy, fast, easily operated! Put your production rivet spinning jobs on Linley Riveting Machines and watch your costs come down.

We are glad to demonstrate the quality of work that can be turned out. Send us samples of your parts and you'll be impressed with what you can do and how little it will cost you. Sizes and types available for iron or cold rolled steel rivets up to 3/4" with capacity for larger rivets of softer materials.

Send for descriptive bulletin R.

LINLEY BROTHERS CO.

673 State St. Ext. Bridgeport 1, Conn.

FRONT LEVER BENCH PUNCH

HAND
OPER-
ATED



WEIGHT
70
POUNDS

Capacity 7/16" hole through 1/4" steel or equal.

65 sizes of round, square, flat, and oval punches and dies are carried in stock to fit this punch.

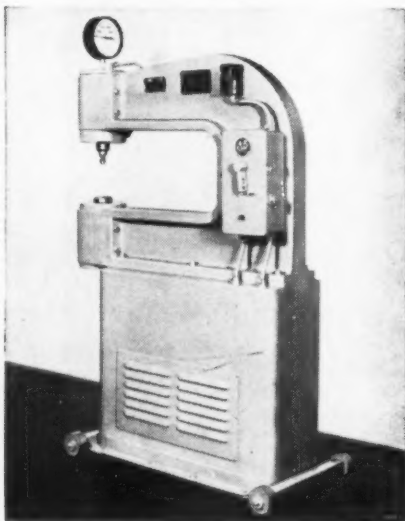
SEND FOR CATALOG SHEETS

T. H. LEWTHWAITE MACHINE CO.

312 East 47th Street New York 17, N. Y.

Brinell hardness tester

A newly-designed Brinell Hardness Testing Machine which incorporates a throat depth of 24" is announced by Steel City Testing Machines, Inc., 8843 Livernois Ave., Detroit 4, Mich. Made especially for a producer of armor plate, this hydraulically operated unit is also adaptable to the requirements of other manufacturers who need a deep-throated hardness tester.



Designated Model AP-1, this unit is mounted on wheels so that it can be rolled out of the way when not in use and then easily rolled into position, reaching out over a conveyor. The lower anvil is the top of a hydraulic piston which rises as the load is applied, to take the pressure off the conveyor. This also tends to keep the material level while the test is being made. Machines are made to order so that anvil height will conform to customer's conveyor height. The maximum vertical opening between the ball penetrator and the anvil is 4".

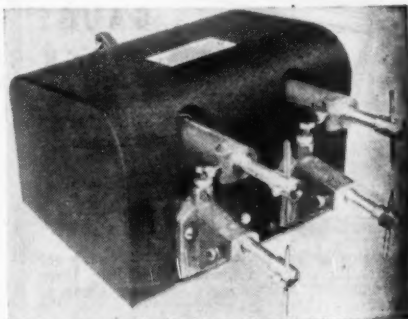
The operating cycle is controlled by a simple snap switch mounted on the side of the machine. The switch is turned "on" to apply the 3000 kilogram load, and the "off" releases the load.

The diameter of the impression is measured with a Brinell microscope, as in all Brinell hardness testing. The hydraulic unit is located in the base which supports the C-frame. Overall dimensions are approximately 41" deep by 19" wide. Height depends on anvil height specified. Weight is approximately 900 lbs.

Double head bench welding head

A new Double Head Bench Welding Head is a recent addition to the small parts welding apparatus line embodying their Tweezer-Weld action, introduced by Federal Tool Engineering Co., 532 Mulberry St., Newark, N. J. Pressure is applied through a cam, acting against the variable deflection of a cantilever spring. The combination of cam and cantilever spring is arranged to provide an instantaneous automatic follow through pressure. Independent switches are provided for each pair of electrodes as well as an independent treadle for each pair of electrodes. Minimum bench space is required, affording maximum convenience.

The electrode pressure is variable from 6 oz. to 15 lbs., by micrometer-like adjustment. This is the Tweezer-Weld action which has been successful in high speed automatic small parts welders operating at speeds up to 3600



welds per hour, built by the same company and now available in Bench Heads. It is also available in a Single Head model.

Nicholson Bulletin 651 Describes New NON-PLUG AIR TRAPS

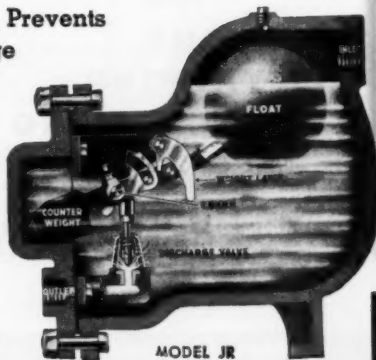
New Oil-Eliminating Feature Prevents Build-Up of Scum and Sludge

In this Nicholson air trap you enjoy the advantages of the positive intermittent action of a float-operated air trap without the common problem of oil congealing on the mechanism and impeding or stopping its action. Three types; pressures to 1500 lbs. See other Nicholson features in Bulletin 651.

W. H. NICHOLSON & CO.

117 Oregon St., Wilkes-Barre, Pa

Steam & Air Traps • Control Valves • Expan. Mandrels • Arbor Presses • Welded Floats



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Order today. Immediate delivery.

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"JOHN'S" DRILL JIGS FOR DRILLING TAPPING MILLING

LARGE OR SMALL PARTS

UNIFORM
ACCURATE
MAXIMUM

PRODUCTION

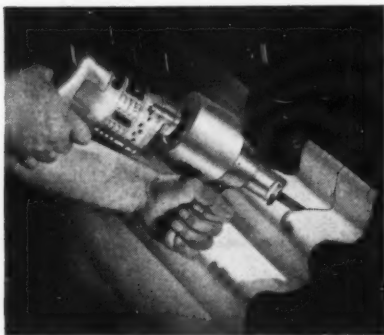
WRITE FOR DETAILS

Manufactured by
HEUSER MFG. CO.

1638 N. Paulina St. Chicago 22, Ill.

Portable power saw and file

A new portable power saw and file named E-Z Saw has recently been introduced by E-Z Way Tool Co., 549 W. Washington St., Chicago 6, Ill. The E-Z Saw is a precision engineered, heavy duty unit that attaches directly to electric or air drills, or flexibility shaft for power. The mechanism of the unit converts the rotary action of the power unit to a fast, reciprocating motion. By inserting an ordinary hack-saw blade in the holder, a power-saw is provided that will cut through all metals including tough stainless steel, Monel and corrugated stock, as well as wood, plastics, and other materials. The tool



is said to be ideal for panel, notching and slotting operations. It can be converted to a power file simply by inserting a machine file in place of cutting blade. Operates with rapid $\frac{7}{8}$ " stroke and is practically vibration-free. Special blades are available for extremely heavy cutting operations. Saw tooth arrangement eliminates gummed teeth when sawing plastics and other like materials.

The unit can be easily carried to the job in place of old methods of bringing the work to the machine. For maneuvering in close quarters, it has an adjustable handle, which can be turned and locked in any desired position. Full length cutting blade can be inserted to reach into hard-to-get-at places.

The E-Z Saw may be obtained complete with an electric or air drill, or without drill for attachment to owner's drill.

PUT YOUR WORNOUT TOOLS TO WORK



WE MAKE NEW CUTTERS OUT OF YOUR DISCARDED TOOLS AT A FRACTION OF NEW TOOL COST.

GUARANTEED NEW TOOL PERFORMANCE

LET US QUOTE ON THE MANUFACTURE OF SPECIAL TOOLS, BOTH HIGH-SPEED AND CARBIDE.

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MANUFACTURERS CUTTER CORP.

275 JEFFERSON STREET

NEWARK 5, NEW JERSEY

NIELSEN Heavy Duty

*Live
Centers*

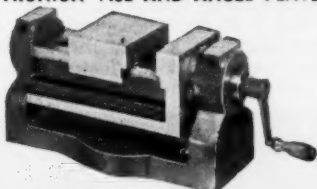
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live centers

Adapted
for heavy
duty work.
Precision type
ball and roller
bearings assure
maximum capac-
ity for high speed
production and long
service.

NIELSEN, INC. LAWTON, MICH.

SAVE YOUR TOOLMAKERS' VALUABLE TIME

PROVIDE A QUICK, EASY-TO-SET-UP
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TRUNION VISE AND ANGLE PLATE



- A sturdy precision 5" vise!
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- Swivels 360°, clamps rigidly in seconds.

Send for Circular AV5

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• LIFT HEAVIER LOADS SAFELY With a Froom

- Perfect load-centering action aligns the load every time. Eliminates strain on threads which cause ordinary eye bolts to break off.
- Heavy objects (machinery, tools, dies, etc.) can be moved safely . . . moved faster . . . intermittently jerked without fear of bolt shearing off. Made from high grade ductile steel. Prompt delivery on stock sizes.

• Special sizes on quotation:

- $\frac{1}{2}$ " to $\frac{3}{4}$ "—\$11.75 each
- $\frac{3}{4}$ "—\$13.50 each
- $\frac{7}{8}$ " to 1"—\$23.50 each
- Specify quantity and thread size.

load centering EYE BOLT

R. H. FROOM & CO.
1738 West 81st St.
Los Angeles 47, Calif.



Improved automatic batch control

Continuous automatic counting of preselected batch quantities at high speed without interrupting production and without missing a single count is achieved by an improved Automatic Batch Counter announced by the Production Instrument Co., 704-14 W. Jackson Blvd., Chicago 6, Ill.

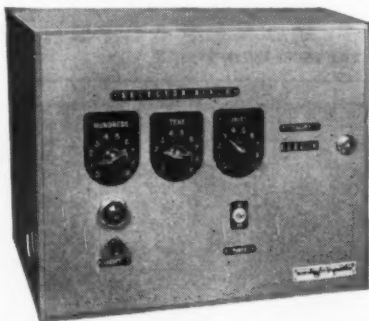
Called the Monitor Automatic Batch Counter, this instrument automatically operates a built-in batch control switch at completion of each batch count, and at the same instant readjusts to start counting the next batch quantity.

The Batch Control Switch may be used to start or stop electrically-operated machinery, conveyors, signals, knockout devices or other arrangements for marking or separating batches, warning operators, etc.

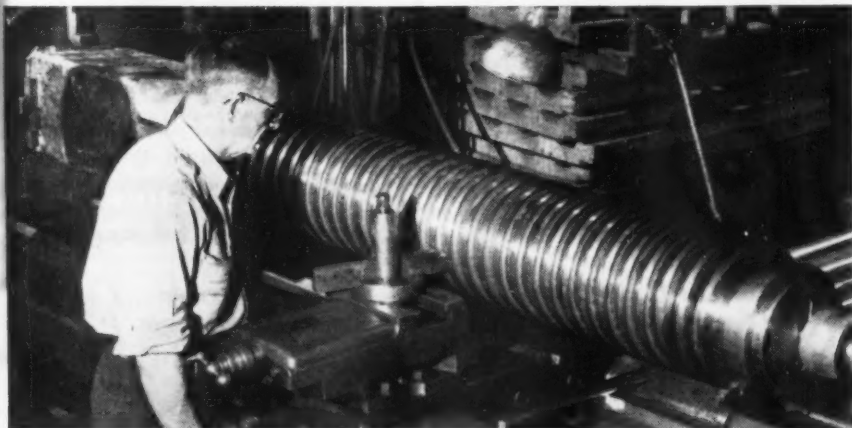
Monitor Batch Counters are furnished in 2, 3, 4 and 5-digit models with counting ranges from 1 to 99, 1 to 999, 1 to 9999 and 1 to 99999 respectively. Any desired quantity within the range of the counter is quickly selected by turn-

ing dial pointers to the desired digits.

Monitor Batch Counters will count any object or motion that can be arranged to operate a switch, relay, photoelectric unit or other circuit-breaking device. The counter may be located at



any distance from the actual source of count. Each Counter is self-contained and equipped with terminal strip for all outside wiring connections.



Electric furnace steel is used in this mill housing screw being turned out at The National Supply Company's Torrance Cal. plant. These screws, made for use in adjusting forming rolls in Kaiser Steel Corporation's Fontana plant, are machined to a tolerance of plus or minus .005". The giant screws have a diameter of 12 inches and are over eight feet long. Each weighs 3200 pounds.

for **VENTILATION, FUME
AND DUST CONTROL**

FLEXAUST . . .

**SPIRAL-REINFORCED HOSE, LIGHT,
STRONG & VERY FLEXIBLE**



Flexaust is of proven suitability for a wide variety of suction and pressure uses in ventilation, fume and dust control.

**EXTREMELY EASY
TO INSTALL —
EFFICIENT AND
ECONOMICAL IN
USE**

SIZES 1 1/2" to 28" dia. Various Flexaust types, accessories, and other hose types also available:

BLOFLEX — Non-reinforced collapsible hose
PORTOVENT — Reinforced retractable hose

Write for full descriptive data and prices.

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17 Park Row
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D & M AUTOMATIC PRESS GUARD



- No Springs
-
- No Cables
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- Fits Any Machine
-
- Low Initial Cost
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- Low Maintenance
-

• This punch press guard meets the most exacting standards of safety engineers and safety laws. Permits operator to feed the press without hindrance.

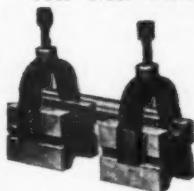
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Immediate Delivery

D & M GUARD Co.
897 Military Rd. Buffalo, New York

WHILE THEY LAST! Precision V-Blocks

Complete With Clamps

**New—Surplus—Army-Navy INSPECTED
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\$5.50

per set
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set

Each block size
1 1/4 x 1 1/4 x 1 3/8 long

Matched Pairs in Original Mfrs. Box

**Send For Our Bargain List
Of Cutting Tools**

Countersinks, Std. & Aircraft, 78°, 82°, 100°, 120°. Reamers—Chucking, Taper-Pin, Expansion. Hand Taps & Dies, Mandrels—Expanding & Plain, Arbors, Cutters, Rotary File Burrs.

**SAVE UP TO 2/3
COLMAN TOOL CO.**

Box 364

Amarillo, Tex.

"OLIVER" 18-inch Metal Cutting Band Saw

For sawing tubing, small rods, sheet metals, woods, hard rubber, compositions.

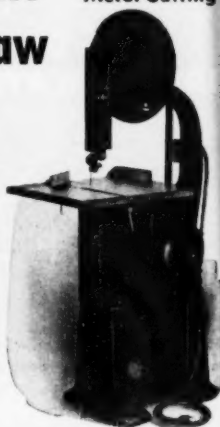
High speed motor or with low speed geared head motor direct connected to lower wheel.

Cuts straight, circles, curves.

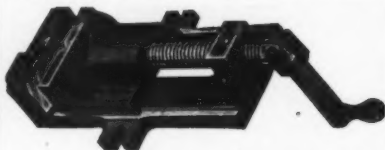
Finest Band Saw of its capacity ever built.

Write for
Bulletin 192-M.

Also made in 30", 36", 38" sizes
OLIVER MACHINERY COMPANY
Grand Rapids 2, Mich.



YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Open inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY

1335 SO. MAIN STREET
MEADVILLE, PENNSYLVANIA

Micro
Supreme
LAY-OUT AND IDENTIFICATION DYE

13 COLORS

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

MICHIGAN CHROME & CHEMICAL COMPANY

6340 E. Jefferson Ave. • Detroit 7, Mich.

Lead screw tapping attachment

A new device called the Lead Screw Tapping Attachment is offered by Automatic Methods, Inc., 42 Walnut St., Room 163, Newark 1, N. J. This new fixture has a precision unit which enables any operator, skilled or unskilled, to do production tapping perfectly with no danger of damaged threads.

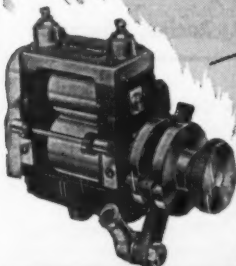


The Lead Screw Tapping Attachment consists of a support arm, with its accompanying clamp, screw, and washers, a lead screw, a split nut, split nut mounting screws, split nut washers, lock assembly, Jacobs Rubberflex collet and nut. The split nut and lead screw are interchangeable for different threads so that a variety of threads may be precision tapped. The assembly is provided as a support arm attachment to any standard drill press.

The thread has to be perfect because the tap is driven by the lead screw. Utilizing the Jacob Rubberflex collet, taps of all standard sizes ranging from 0" to ¼" may be used without changing the collet. When used with any standard reversing type tapping head in a drill press, production can be substantially increased over other methods because the lead screw can be depended upon to produce an accurate fit in every thread cut.

A UNIVERSAL FAVORITE: ROLL FEED \$89.50

A truly remarkable unit which is a universal favorite and priced within your budget. Quality built for long dependable service. Models available to fit all sizes of power presses.



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informative circular

ROLL FEEDS CORPORATION
Pawtucket -- Rhode Island
Builders of Electric Precision Die Millers

This unit is available now from stock in sizes to fit 14" to 15" drill presses having a 2 3/4" diameter column. Lead screws and nuts are carried in stock in the following pitches: 20-24-28-32, 36-40-44-48, 56-64, 72-80.

Grinding wheel bond for carbide tool sharpening

A new grinding wheel bond, designed especially for tungsten carbide tool sharpening, has just been developed by Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Ill. Promising new time and cost economies in a field threatened with material and labor shortages, the bond—"XL"—is claimed by the firm to make vitrified silicon carbide grinding wheels superior to any now on the market.

"XL" bonded wheels, it is said, are recommended for offhand or precision grinding of carbide tools on milling cutters, broaches, reamers, counter bores, and similar applications. Tough and long lasting, they provide cutting action that is both cooler and faster than conventional silicon carbides in comparison tests. According to a com-

THE "RFC" MODEL 2 STOCK REEL

Save time . . . speed production with this sturdy yet economical stock reel. Equipped with adjustable clamps, coils can be positioned quickly and easily. Controlled reel tension. Adjustable angle bracket available. Quick acting clamps for speedy positioning without bolts or screws.

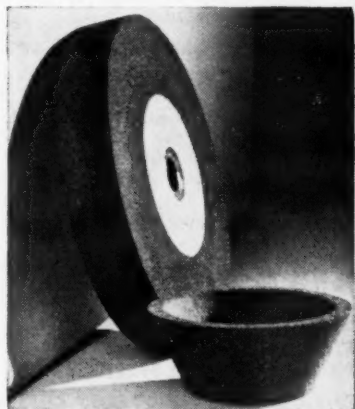


\$97.50

Write today for
informative circular.

ROLL FEEDS CORPORATION
Pawtucket -- Rhode Island
Builders of "RFC" Roll Feeds

pany spokesman, "XL" wheels are "the closest we know to a diamond wheel."



An important development in the light of today's urgent production requirement and material shortages, "XL" wheels are being supplied in the most popular straight and cup wheel sizes and steel backs.

INSTANT ACTION RAPIDSET by HARTMANN

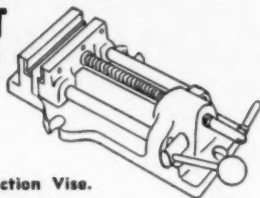
All Purpose Tool Room and
Machine Shop Vises.

The JAWSET

Adjustable Pressure Production Vise.

For Information Write Dept. M

Hartmann Mfg. Co., 1637 Gould St., Racine, Wisconsin

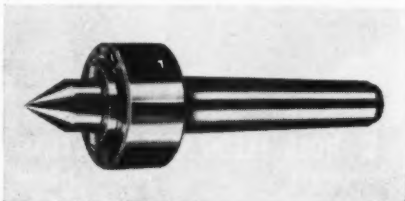


Regent precision live centers

The Regent Live Center, designed exclusively for light duty and precision small parts production jobs, has recently been introduced by Royal Products, 82 Union St., Mineola, N. Y. This precision tool is designed with a small "free-turning" point which turns with the smallest parts, where the point of the average live center will not revolve, the manufacturers state. The Regent Live Center is said to provide exceptional rigidity, due to the stabilizing bearing located in the shank. The shorter overhang of the tool eliminates chatter. An accuracy of .0001" is guaranteed in this live center.

The Regent Live Center is available in numbers 1, 2 and 3 Morse Taper. The tool is said to have minimum deflection, provided through the stabilizing bearing and the rigid one-piece point. An Oilite bearing and ball bearing, protected with positive seal, assure lubrication for the line of the bearings. The manufacturer also makes

the Regal Live Centers for medium duty and Empire Live Centers for



heavy duty and extra heavy duty work on lathes, grinding and milling machines.

Preis-Panto engraving machine

The new "sight feature" provision of the Preis-Panto Engraving Machine designated as the Model UE-3 Engraver permits the operator to see every portion of the work in process, according to H. P. Preis Engraving Machine Co., 647 State Highway 29, Hillside, N. J.

This improved model engraving machine is sturdily constructed and is

CHASERS

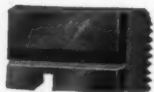
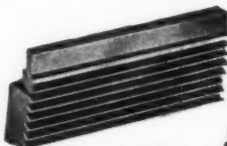
STANDARD:
OR MADE TO YOUR SPECIFICATIONS

To Fit All Types
of Die Heads

QUALITY
CHASERS
Sell For Less

QUALITY CHASER
OFFERS YOU:

1. Master Workmanship.
2. Top Performance.
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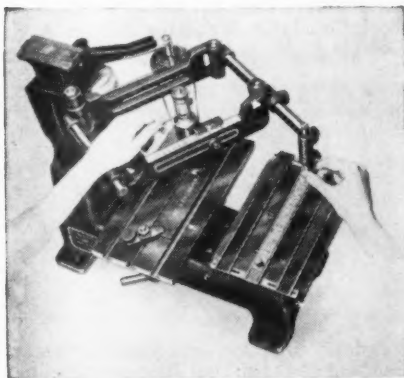
24000 Stephenson Hwy
HAZEL PARK, MICH.

ALINA CORPORATION—32 BROADWAY, NEW YORK 4, N. Y.



For taking inside, outside, depth and undercut measurements. High precision tools that invite comparison. Money back guarantee. Graduated to read $1/1000''$ and $1/128''$ or $1/1000''$ and $1/20$ mm. When ordering, please specify graduations desired.

made of selected materials, with a minimum of bulk and weight. The pantograph arms are of a cut-away construc-



tion, giving a full view of the work to the operator, a feature of great advantage in preventing engraving errors.

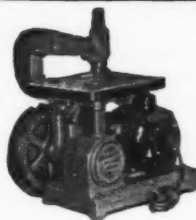
The adjustments for pantograph ra-

tios, which range from 1.7:1 to 7:1 are accomplished on cylindrical sliding members with improved precision markings. A positive lock is provided for guaranteed accuracy. This advanced construction enables an operator to engrave raised or sunken lettering with a maximum of precision, into unhardened alloy tool steel, as well as a variety of other metals and plastics. The improved adjustable copy table (patented) holds either metal or molded plastic (raised or sunken) letter masters. A forming guide may be used for engraving concave, convex or spherical beveled surfaces.

The precision ball bearing spindle has a handy cam-actuated drop lever for raising or lowering the engraving cutter from the work. This has a drop of $5/32''$ and is graduated in $.001''$ finger screw adjustments. The outstanding advantage of this new "sight feature" is that it gives the operator a centralized view of both the actual engraving and master copy being followed.

MILWAUKEE

**DIE FILERS
PROFILE GRINDERS**



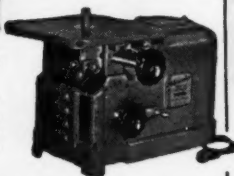
Embody Many Improved Features

... features that result in higher efficiency, improved operating convenience and, most important, lower costs in your filing, sawing, lapping and grinding operations.

Write for Illustrated Bulletins

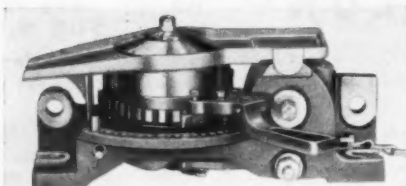
RICE PUMP & MACHINE CO.

224 N. Milwaukee Street



Grafton, Wisconsin

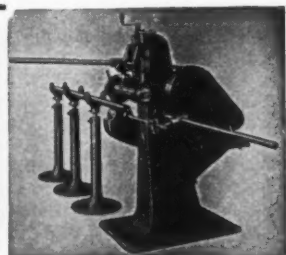
MODEL H . . . AUTOMATIC CHUCKING and INDEXING FIXTURE



1. 1800 light cuts per hour.
2. Either horizontal or vertical position.
3. Collets changed instantly.
4. Automatically knocks piece out.
5. Ratchet or degree indexing—degree indexing added later if desired. Capacity 1".
6. Automatic indexer also added later. Model F—Both degree & ratchet indexing. Capacity up to 2 1/4".

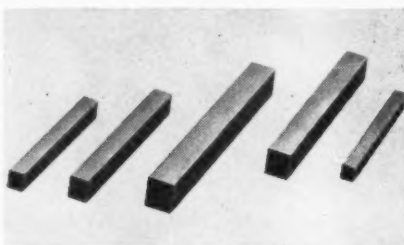
Write for Folders

J. W. DEARBORN, Ansonia, Conn.



Gorham tool bits and turning tools

Three distinctive tool bit materials to meet various metal working applications have been developed by Gorham Tool Co., 14400 Woodrow Wilson Ave., Detroit 3, Mich. Available in stock in



standard sizes for immediate delivery. Gorham Ground Tool Bits and Turning Tools can now be obtained in these three materials.

They are: Gorham "Standard", for the commercial field, Gorham "M-40-B", a Super Moly grade for heavy duty

Faster TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters 1/8" to 3"; 1/2" to 6"; 3" to 12".

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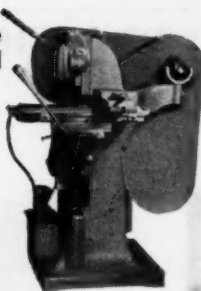
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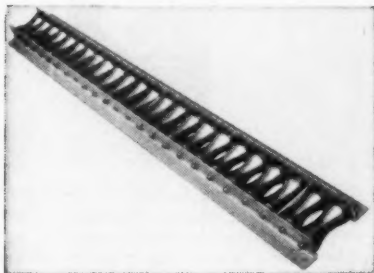
20 East 72nd Street Cincinnati 16, Ohio



turning, and Gorham "Gormet", for turning soft or abrasive stock at high speeds. Gorham Ground Cutoff Blades, in 17 stock sizes, are also available in the "Standard" material.

Gravity conveyor for shells

Gravity conveyors with specially shaped rollers for handling 75 mm. to 155 mm. artillery shells are announced



by the Samuel Olson Mfg. Co., 2421-27
Bloomingdale Ave., Chicago 47, Ill.

Designed to store and move shells from machine to machine between operations, the conveyors can be furnished to required lengths.

The rollers are of one piece steel, swaged from 10-gauge electric welded tubing. The roller shafts are mounted on ball bearings. A 7/16" hexagonal shaft is used to prevent bearings turning on the shaft and to prevent shaft turning in the roller. Rollers are 2 3/4" diameter x 5 1/2" long. For handling finished shells the rollers can be furnished with rubber coverings.

GRINDING WHEEL FACTS

Answers to quiz on page 246.

1. Aluminous
2. Softer
3. Softer
4. Softer
5. Forcing work
6. Keep moving across face of wheel.
7. Less
8. Less
9. Cup
10. 4,500-6,000

MACHINISTS—TOOL AND DIE MEN—SHEET METAL WORKERS—ETC.

FREE SAMPLE BLUE LAYOUT DOPE

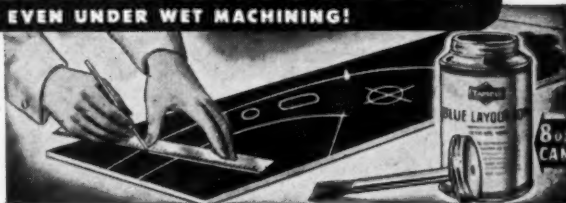
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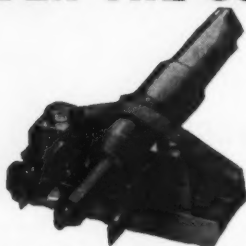
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DTR

Diamond
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FOREMOST IN DIAMOND TECHNOLOGY

Welding helmet for bifocal glasses wearers

Dr. Ellis L. Rabben, industrial optometrist, of Norfolk, Va., has developed, in conjunction with Willson Products, Inc., Reading, Pa., an optical aid for welders who wear bifocal glasses. The device, manufactured and marketed by Willson under the trade name "Weld-Aid Lens" is designed to help operators who depend on bifocal glasses for near vision. Since the vision



slit of the welding helmet is placed for looking straight ahead, it does not permit use of the bifocal segment, and welders who wear this type of glasses frequently suffer blurred vision, eyestrain and headaches which reduce their productivity and skill. Thus, by the time many welders have accumulated considerable experience, they find it increasingly difficult to work at their trade because they cannot see well.

The Willson Weld-Aid Lens corrects this condition by supplying clear and unobstructed near vision over the entire area of the window in the helmet, thus replacing the unusable segment power of the welder's prescription glasses. The lens consists of high grade optical glass accurately ground to a specific power and mounted securely in a durable plastic frame which fits easily

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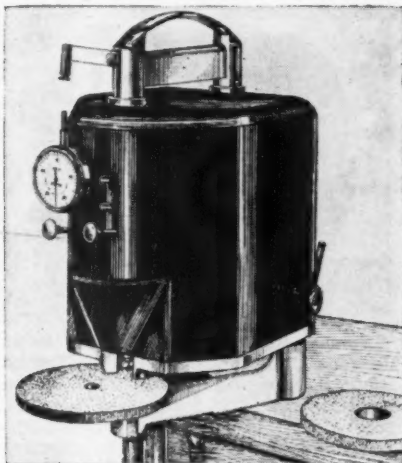
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into the average welding helmet. It is available in two sizes, 2" x 4 1/2" and 2" x 4 1/4" and in five powers: 0.75, 1.00, 1.25, 1.50, and 1.75. Complete instructions are furnished with each lens. To protect the Weld-Aid from front and rear pitting, it is recommended that it be placed between the cover and filter lenses.

Grinding wheel testing instrument

A precision testing instrument for grading grinding wheels, called the Grade-O-Meter, has been introduced by Ottawa Engineering and Sales Co., Marne, Mich. This ingenious device will divide all types of grinding wheels into each of its various grades, to an exact degree, its manufacturers state. The Grade-O-Meter will also indicate numerically the exact grade of grinding wheel needed for each job. Definite limits of grinding wheel tolerance for each grinding operation can be established by the use of this instrument.



Repetition of expensive trial and error methods on determining types of grinding wheels are said to be positively prevented by the use of this device which is stated to stabilize and increase production.

According to Ottawa Engineering and Sales Co., recent surveys have determined that the average grinding wheel

WORTH CONSIDERING....

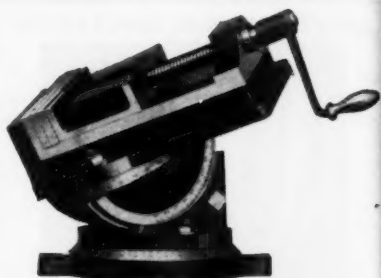
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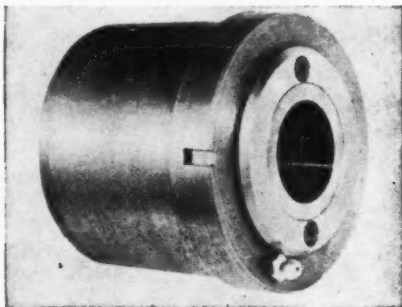
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GROBET FILE CO. of AMERICA, INC.
421 Canal Street New York 13, N. Y.

user who spends \$1000 or more for wheels yearly also spends an additional five to ten thousand dollars per year for labor, power, spoiled work, dressing equipment, etc., for these same wheels. Reports from the field indicate that the Grade-O-Meter will effect savings of 20% or more of these total expenditures.

Roller bearing pilot bushings

The Jergens roller bearing Pilot Bushing, manufactured by J. G. Jergens Co., 11106 Avon Ave., Cleveland 5, Ohio, is a device which is standard for exacting builders of high precision machines and machine work, according to its manufacturers. The Jergens Pilot Bushing offers extreme accuracy, is adjustable for wear and gives complete protection by sealing against damaging grits and dirt. The extreme precision of the Pilot Bushing is maintained by the use of Timken Precision tapered roller bearings.

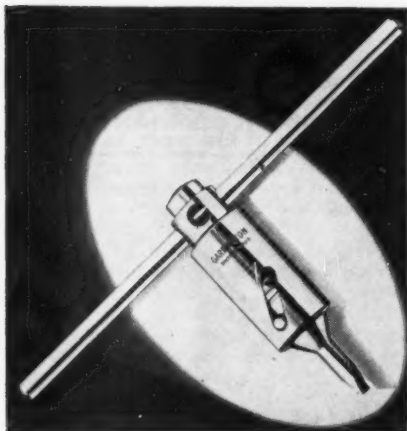


Special applications suggested for the Jergens roller bearing Pilot Bushing include steel mill roll grinding, for pressure rolls and for grinder head tail stocks. A four-page descriptive bulletin, available from the manufacturer, gives complete specifications and dimension sketches.

"Skua" impact screwdriver

An ingenious new tool called the "Skua" Impact Screwdriver is now available in the United States through its distributors, R. Caluwaerts Co., Inc., 1 West 67th St., New York 23, N. Y. This tool is stated to solve the problem

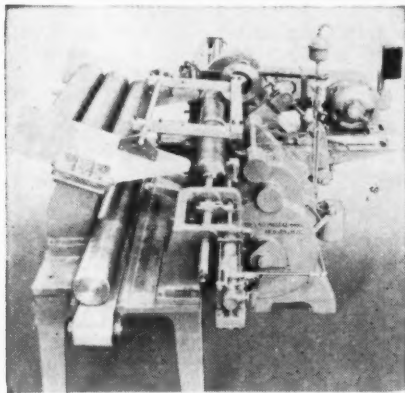
of rusted screws; tapping the head of the screwdriver forces the rusted screw to turn in a counter-clockwise direction, thereby loosening it. An ordinary screwdriver can then be used to complete the removal.



This useful tool is provided with a cross-bar through the top of the shaft in order to facilitate its handling. The "Skua" Impact Screwdriver is manufactured in England by the well known firm of John Garrington & Sons, Ltd.

V & O shell trimming machine

The V & O Press Company, Division of Emhart Manufacturing Co., Hudson, N. Y., announces the addition of a new



August, 1951

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Just slip a tap adapter into the Dahlstrom Tap Guide and twist. Your hand tapping will be quick and accurate. For machine tapping, the spindle top is center-bored to fit the tail stock center of a lathe. Size 13" x 8" x 14". Includes 9 adapters (8/32 to 3/4"). Taps not furnished. Dahlstrom Mfg. Co., 2506 W. Larpenteur, St. Paul 8, Minn.

WRITE FOR PAMPHLET.

Dahlstrom TAP GUIDE

machine to its line of Shell Case Trimming equipment, known as the No. 986 Shell Trimmer.

This machine has the capacity for handling 155 mm. shells, with a maximum length of 52", a maximum diameter of 8 1/4", and a thickness of .150". It is equipped with an automatic chute for feeding the shells, has an air-operated mechanism for locating the shells in position for the trimming operation, and is provided with automatic ejection to deliver finished shells to a conveyor.

ILLUMINATION QUIZ

Answers to quiz on page 276.

1. One candle of light.
2. Parallel to axis.
3. Reflector surfaces.
4. Bringing light rays from more than one angle.
5. A shield to prevent glare.
6. Square foot of area.
7. From North.
8. Enlarge.
9. Lumens per square inch.
10. Four times.

355

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GRAY IRON ANGLE PLATES

MACHINED $\pm .002$ FROM FLAT

2" x 2" x 2"	S 2.70
3" x 3" x 3"	3.60
4" x 4" x 4"	4.40
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6" x 6" x 6"	10.90
8" x 8" x 8"	16.70
12" x 12" x 12"	35.50

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231 CENTRE ST.

Electro arc metal disintegrator

Electro Arc Manufacturing Co., 5930 Commonwealth Ave., Detroit, Mich., has introduced several new features and new cutting speeds for its line of Electro Arc Metal Disintegrators. These include electronic control of the machine without tubes, obviating possible tube burn-out, etc. High cutting speeds are now possible, since the electrical current to the operating head is rectified to d-c. The head is so constructed that contact is made 60 times per second at an a-c peak of positive one-half of sine wave. Since the maximum burning power can only be obtained at this peak, the highest possible cutting efficiency is assured at all times.

A solenoid actuates the spindle downward, assuring steady contact with the metal at all times, regardless of the position of the operating head.

Typical average cutting speeds claimed by Electro Arc include the following, any of which may be duplicated by any operator who has a working knowledge of these units: a $\frac{1}{8}$ " drill, 2" deep can be disintegrated in $1\frac{1}{2}$



minutes; a $\frac{27}{64}$ " reamer, $1\frac{1}{4}$ " to $1\frac{1}{2}$ " deep can be disintegrated in 2 minutes; a $\frac{3}{16}$ " hole can be cut through $\frac{3}{32}$ " deep hardened steel (62 Rockwell) in 10 seconds; a $\frac{1}{4}$ -20 tap at a depth of

Plug Gages

Ring Gages

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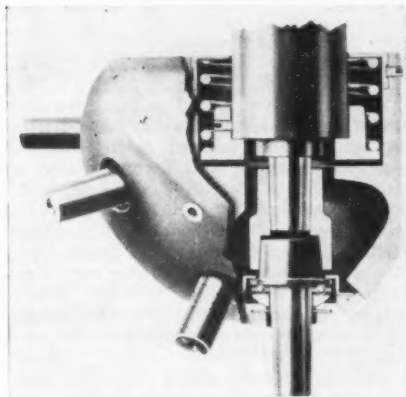
GEAR WORKS, INC.

198 LAFAYETTE ST. N.Y. 12, N.Y. CA 6-1440

from $\frac{7}{8}$ " to 1" can be disintegrated in one minute; the new Electro Arc unit will disintegrate a $\frac{1}{2}$ -13 tap to a depth of $1\frac{5}{8}$ " in 4 $\frac{2}{3}$ minutes.

Self-centering drilling turret

Redesign of bearings in the Lign-o-matic turret, manufactured by Howe and Fant, Inc., 525 Flaxhill Road, So. Norwalk, Conn., increases the life and precision of what is claimed to be the only self-centering turret for drilling machines on the market today. These bearings permit the Lign-o-matic spindles to move laterally and angularly, as well as to rotate. When the drilling machine spindle is lowered, the tapered surface of a driver (rigidly mounted on the drilling machine spindle) engages the mating tapered surface of a turret spindle. The bearing construction allows the turret spindle to be moved into exact alignment with the drilling machine spindle. The turret spindle is locked in position and cannot get out of alignment during the drilling operation.



Other design changes, plus rigid operating tests and individual inspection of every turret after assembly have reduced over-all run-out to less than 0.0001". Hollow spindles reduce weight and permit sustained accuracy at high operating speeds.

The new Lign-o-matic can be indexed (without stopping the motor) faster than tools can be changed or work moved to another spindle. As a result,

DUAL CROSS and ROTARY FEED

PALMGREN Rotary, Index MILLING TABLE

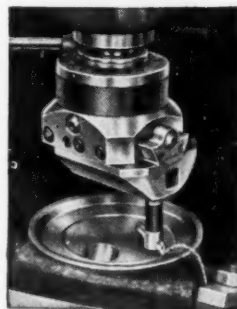
No. 83 Only \$54.50 Has 8" table, 360° movement and 4" cross feed travel. Adjusting wheels and dials graduated in degrees and thousandths. Slotted for bolting to table. No. 82 without rotary feed \$42.75. Write for Circular No. 354.

CHICAGO TOOL and ENGINEERING CO.
8384 South Chicago Ave. Chicago 17, Ill.

a Lign-o-matic turret mounted on a single spindle will release five drilling machines for other work and still show increased production and reduced costs on the original job.

The Lign-o-matic fits any standard drilling machine without altering the machine. A single turret handles up to six different operations, such as drilling, reaming, counterboring, and tapping (on reversible spindle machines) up to $\frac{1}{2}$ " in diameter in any material.

ANOTHER NEW "MASTER TOOL" THE UNIVERSAL "MASTERHEAD"



**ONE
TOOL
ONE
SET UP
... for
boring,
facing,
turning,
recessing,
undercutting**

Featuring: automatic feeds, end release and return; adjustable stop; adaptable to all standard machines; highest precision; ideal for jig borers; seven models for work up to 24" diameter.

Send for Illustrated Literature

KARL A. NEISE

381-4TH AVE., DEPT. BB, N. Y. 16, N. Y.

Portable pen size greaser

An ingenious portable grease gun in convenient pen size has just been introduced by Gaunt Industries, 827 Irving Park Road, Chicago 13, Ill. This useful device, called the "Hypo-Lub", has been especially developed for fine greasing operations in office or factory. It is useful for instrument and tool makers, electricians, assembly line workers, instrument repairmen, etc.

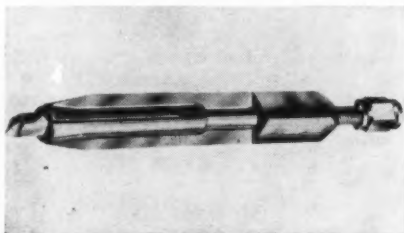
The "Hypo-Lub" contains a one-inch fine hypodermic needle of .049" o.d. and .035" i.d. The device is easy to use; the plunger is depressed for the desired amount of grease; for a minute quantity, the grease chamber itself is squeezed. Inaccessible machine parts are reached and lubricated without damage or smearing by means of this tool. It is provided with a visible plastic grease chamber. A dustproof cap protects the needle when the tool is not in use.



The "Hypo-Lub" is stated by its manufacturers to be ideal for injecting new grease into rubber sealed ball bearings.

Bar-Mor collet tool holder

A useful new lathe attachment called the "Bar-Mor" Collet Tool Holder has recently been introduced by Montgomery & Co., Inc., 53 Park Place, New York 7, N.Y. The single unit construction of holder and cutter gives the "Bar-Mor" Collet Tool Holder strength and rigidity, permits easy setting at constant tool height, free access to the work without disturbing the set-up, faster feed and heavier cuts.



With this one tool, the machine operator can do left and right hand turning, and drilling, as well as the following jobs: **turning and facing:** Using a knife edge or round nose tool with hollow ground top, clearance is obtained by rotating the collet; **boring:** With tapering front of the holder set at a slight angle, the operator can bore deep holes with ease; **internal screw cutting:** by holding the ground threading tool at required projection for accurate internal thread cutting; **cutting a square thread:** After grinding the collet to desired thread, the helix angle is obtained by rotating it.

The Bar-Mor Collet Tool Holder holds both square and round tool bits, twist drills, reamers and countersinks. When the collet is drawn into the holder, it is gripped on all sides and maintains its position under exacting conditions, because the taper on the collet head matches the internal taper at the front of the holder.

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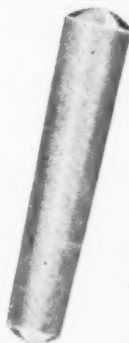
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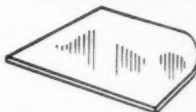
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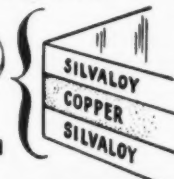
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 - SILVALOY #5031



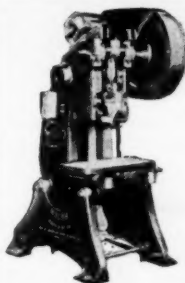
Silvaloy No. 2501 and No. 5031 are
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.020 thick consists of .010 copper center-
clad both sides with .005 Silvaloy No. 2501
.011 thick consists of .005 copper center-
clad both sides with .003 Silvaloy No. 503
.016 thick consists of .008 copper center-
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Each of the alloys are furnished with or
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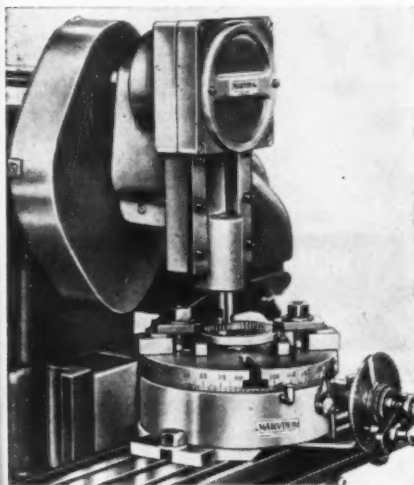
SCHULTZ & ANDERSON CO.

111 EDISON PLACE
NEWARK 5, N. J.

Marvin slotting attachment

A slotting attachment possessing a positive drive, regardless of the rate of speed of the parent machine, plus other features which add to its versatility, is being introduced by Marvin Machine Products, Inc., 414 Ford Bldg., Detroit 26, Mich.

This ingenious new slotting device is equipped with a roller chain which eliminates slippage and allows heavy



cuts. Operator protection is provided by a safety hood mounted over the transmission.

Drilling attachment for rotary tables

Worm Wheel Operated Tables made by Troyke Mfg. Co., Inc., 4422 Appleton St., Cincinnati 9, Ohio, are now so designed that a drilling attachment can be supplied.

This drilling attachment can be used for drilling jobs such as shown in the illustration, without the use of an expensive drill jig. It is stated to be a great time saver for small quantities or single pieces.

The end of the arm has a removable bushing with a standard $\frac{3}{4}$ " hole into which can be inserted bushings for the required drill size. It is quite obvious that jobs can be duplicated at a later

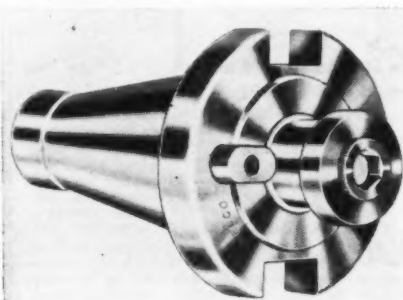


date, although no drill jig is available. These drilling attachments can be supplied for all rotary tables from 12" to 25".

Nelco shell milling cutter arbor

The Nelco Tool Company, Manchester, Conn., manufacturers of carbide tools, announces their new Shell Milling Cutter Type C Arbors.

This arbor requires no special wrench, as all sizes are equipped with socket head standard lock screws. It is universally adaptable to milling machines and cutter grinders having National Standard Spindle Tapers. Available in $\frac{1}{2}$ " to 2" diameters, this arbor is manufactured



from chrome-molybdenum steel, precision ground and heat treated for long accurate life. Removable keys make it possible to install a side milling cutter if necessary.

RUNS COOL AT 38,000 R.P.M.

Roto-Master Hi-Speed grinder makes carbide roughing and finishing available to every shop. Designed for operations requiring precise "finger-tip" control, in conjunction with carbide burrs and mounted wheels from $\frac{1}{8}$ " to $\frac{3}{4}$ " dia. Operates on 110-120 Volt AC or DC, any cycle.

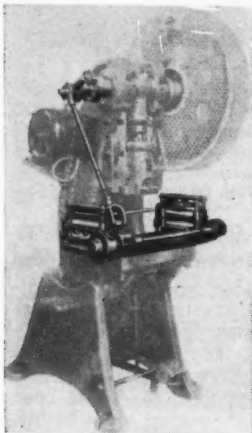
Roto-Master's SUPER COOLING system enables operating speed of 38,000 RPM. Operation requires practically no pressure . . . consequently grinder can be used continuously for hours without heating. Try Roto-Master in your shop. If not completely satisfied return within 15 days at no charge. If not rated send check or M. O. for \$32.50.

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La Bahn Machine & Mfg. Co.

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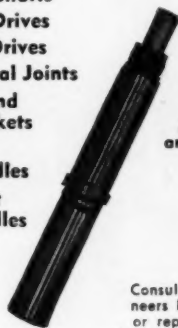
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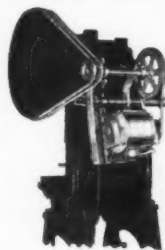


Consult SEIBERT engineers before retooling or replacing parts on multiple spindle machines.



Manufactured by

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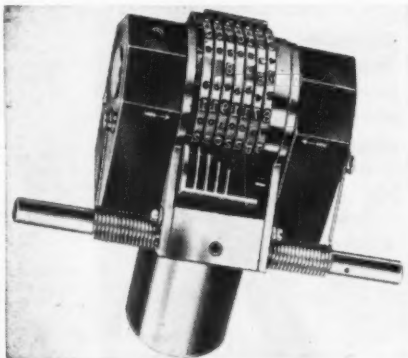
No need to use slow speed or geared motors and small pulleys to slow down your presses. Utilize standard 1750 RPM motors. "V" Belt Drive absorbs shock. Operate smoothly, silently, efficiently, economically.

Write to Dept. BB for complete details.

MODERN MOTOR DRIVES DIV. of The Nichols Eng. Co.
Dept. BB, 3818 W. GRAND AVE. CHICAGO 51, ILL.

Numbering heads for punch press stamping

The Parker Stamp Works, Inc., Franklin Ave., Hartford, Conn., announces a new line of automatic numbering heads for punch press stamping. Standard numbering heads permit numbering from 1 to 999999999 in Sharp Face Gothic characters for numbering any material including steel, or in Flat Face Gothic or Shaded Roman, recommended for use on brass or other soft metals. These heads are said to guarantee sharp, accurate stamping of consecutive or repeat numbers; a duplicate attachment can be added if required.



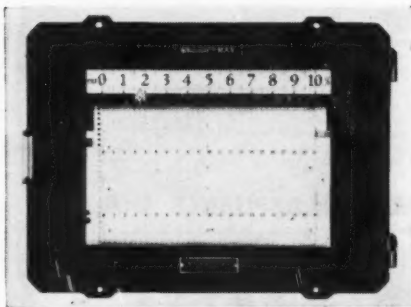
Direct reading is possible on the larger heads. This enables determination of machine setting at a glance from engraved numbers on the front of the lettering wheels.

Meter for recording speed ratio changes

The percentage stretch or shrinkage of materials being processed through pairs of rolls turning at different speeds is indicated and automatically recorded by the Tag-Weston recording speed-ratio tachometer, recently offered by the Tagliabue Instruments Division, Dept. 414, the Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J. The instrument provides a continuous record of roll speed ratio for textile, paper, plastics, rubber, chemical and metal-rolling industries.

Operated by two Weston Model 724 tachometer generators driven by the

respective rolls, the instrument consists essentially of a specially developed Tagliabue Model 47001 Celestray ratio

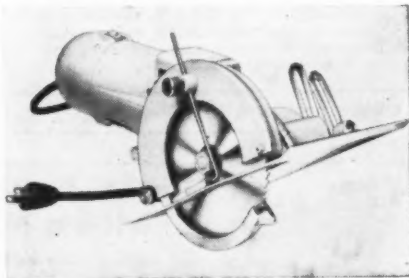


recorder. The ratio meter and recorder can be calibrated in inches per yard shrinkage in fabric Sanforizing, percentage reduction as in metal rolling, or other units which are a function of the speed ratio between two rotating numbers.

Whirl-Saw, portable power tool

Another portable power tool is announced by the Forsberg Manufacturing Co., Bridgeport, Conn.

The Whirl-Saw Model No. 3, portable cut-off saw is claimed to out-perform any saw in its price class. It has been designed for good balance, easy handling and lasting satisfaction.



This saw will make clean, straight cuts, both rip and cross cut. It will cut angles up to 45°. The depth of cut is adjustable from 0 to 1½". The tool weighs only six pounds. It is furnished complete with one blade in a display box.



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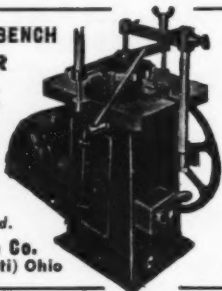
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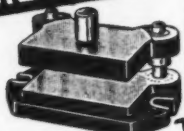
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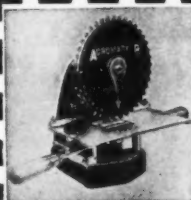
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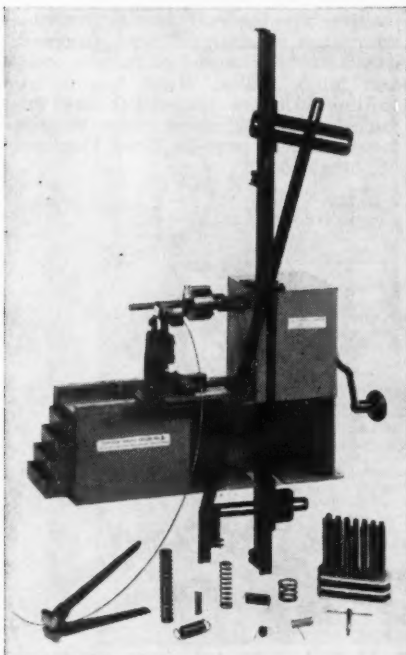
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15 MORRELL ST. ELIZABETH 4, NEW JERSEY

Carlson spring coiling machine

A new hand-operated spring coiling machine for making rather large compression, extension and torsion springs, has been introduced by The Carlson Co., 277 Broadway, New York 7, N. Y. This new Coiler No. 2, supplements an earlier and smaller model No. 1 (now extensively used in many manufacturing plants), and has twice the capacity of the smaller machine.



It is said to be especially useful for making experimental or sample springs and for short production runs up to about 500 pieces as the set-up time is usually less than 5 minutes and the output is up to 300 precision springs per hour. Compression springs can be wound up to 8" long with any number of coils up to 30, to any pitch up to 1", and the end coils are closed or squared automatically on both ends. Extension and torsion springs can be wound tight or loose, up to 8" long, either left or

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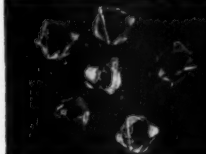
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11/64" x 12"	2.06
3/16" x 12"	2.06
13/64" x 12"	2.19
7/32" x 12"	2.19
15/64" x 12"	2.40
1/4" x 12"	2.40
17/64" x 12"	2.55
9/32" x 12"	2.55
19/64" x 12"	2.75
5/16" x 12"	2.75
21/64" x 12"	3.11
11/32" x 12"	3.11
23/64" x 12"	3.46
3/8" x 12"	3.46
25/64" x 12"	3.81
13/32" x 12"	3.81
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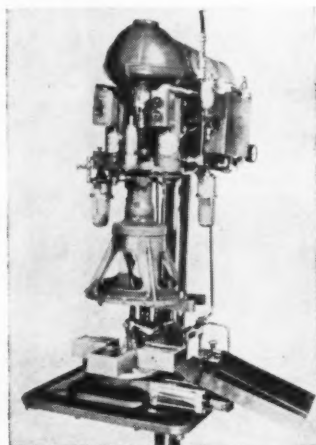
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right hand, up to 150 coils, with extended arms on both ends up to 5" long. Outside diameters up to 2" and wire diameters from .041" to .156" can be coiled. An arbor rack with 29 arbors, seven coiling points and a wire cutter are included.

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The Beckett-Harcum Co., 1140 Wayne Road, has introduced high production tapping and drilling machines which can be equipped with automatic, air-controlled multiple spindle heads and index tables. These tapping and drilling units are designed to meet customer's specific production requirements and to provide great flexibility of operation.



Multiple tapping can be performed direct from a multiple drill head, without lead screws or clutches. Very light air pressure permits the taps to provide their own lead. There is no forcing of the tap and no galling action results. Threads produced are exact duplicates of the taps used. Both Class 2 and Class 3 fits can be obtained in soft metals such as magnesium and soft plastics, as well as in stainless and chrome molybdenum steels. Multiple tapping is accomplished with a high-reversal motor which reverses the taps when they reach desired depth. Tapp-

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1950



P-3 STRATO POWER PUMP

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1950



P-4 VICKERS ANGLE PUMP

Positive displacement type, angle piston. Displaces .507 cu. in. per revolution. Has capacity of 6 gal. per min. at 3000 RPM at 1500 PSI., continuous, 1875 for 15 sec. Operating speed of 3750 RPM, intermittent maximum, 4500 RPM. Rotates to the right only.

1949

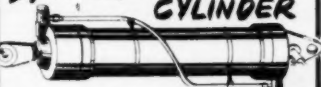
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9750

Special! HYDRAULIC CYLINDER



Gives 20,000 lb. thrust (push or pull) using 1500 PSI line pressure as obtained from our hydraulic pumps. Will produce up to 40,000 lb. thrust with 3000 PSI. Can also be used on low pressure air systems. 4" bore; 18" stroke; 30 1/2" length. Ideal for road-form - shop machinery.

2995



No. 3 HYDRAULIC CYLINDER

Double action. Bore is 1" - Stroke 1/2". Has stroke of 2 1/2" to 4". Stroke can be adjusted with internal sleeve stops. Overall length is 8 1/2". Will take 1500 lbs. continuous duty, 2000 lbs. intermittent. Will lift or push up to 1100 lbs.

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Poppet type. Valve shuts off at neutral position. Has 3/8" AC tube ports - 9/16 - 20 thread. Will stand 1500 PSI.

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ing depth can be accurately controlled. By reversing the motor, taps lead out without stripping the last thread, even in extruded holes in very soft metals. The motor is capable of a complete cycle every three seconds.

By switching out the motor reversing control, drilling operations can be performed and the same fixtures used for drilling may be used for tapping by removing the drill bushings.

Speed of both the forward and return spindle is infinitely variable and a hydraulic break-through cushion is

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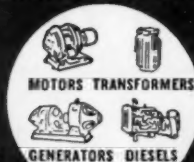
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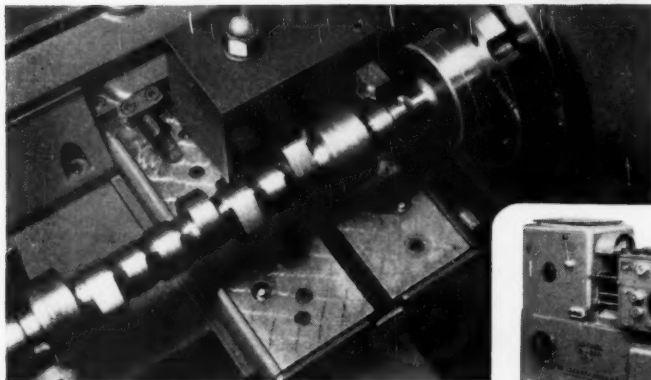


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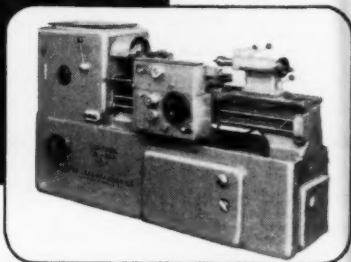
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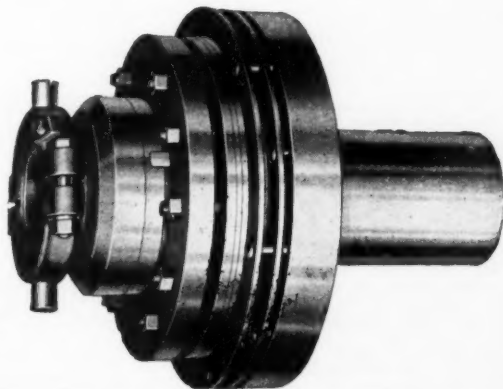
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9/16	15	12	7.70
19/32	15	12	8.25
5/8	15	12	8.80
21/32	15	12	9.00
11/16	15	12	9.10
23/32	15	12	9.35
3/4	15	12	9.50
25/32	15	12	10.50
13/16	15	12	12.00
27/32	15	12	12.65
7/8	15	12	13.20
29/32	15	12	13.75
15/16	15	12	14.30
31/32	15	12	15.40
1	20	15	17.60
1- 1/16	20	15	18.70
1- 1/8	20	15	19.80
1- 3/16	20	15	22.00
1- 1/4	20	15	24.00

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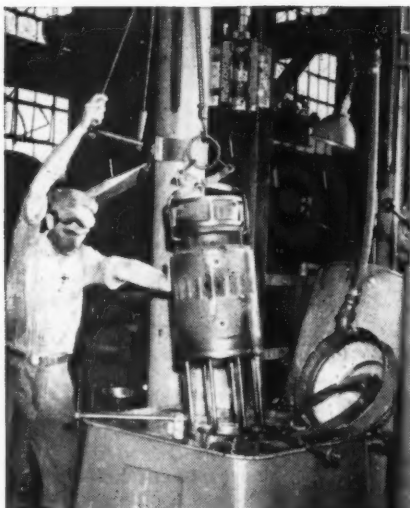
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Alexander Ball Tools available in sizes to 50".

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Why divide responsibility for the performance of your honing operations among several suppliers? Fulmer supplies a *complete honing package* — honing machine, tools and necessary fixtures—giving the user *one source* that *guarantees* best honing results!

Fulmer Honing Machines are engineered to give maximum production with minimum investment. They are known for rapid stock

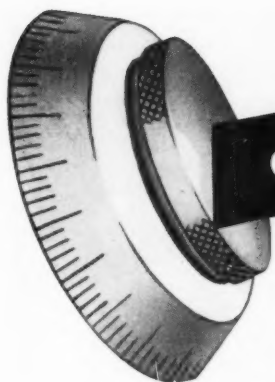
removal and extreme accuracy. Quick change over for various size jobs. The machines are simple to operate—easy to set up—many users have unskilled labor operating them efficiently.

Save on production time, cut costs and improve quality on finishing all classes of cylindrical bores with a *Fulmer Honing Package*—it offers the *greatest value* in the honing field. Write for Bulletin No. 10 and full details.

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this fast, easy way!

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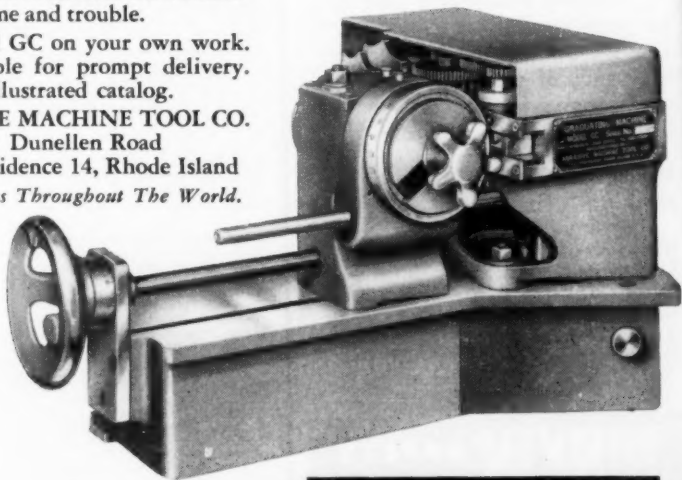
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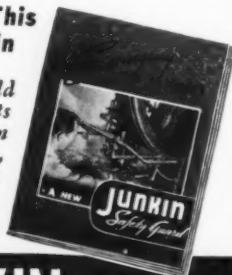
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The Junkin Safety Guard is effective . . . dependable. It can't "forget" because it's built in . . . actually becomes a part of the press itself.

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- Full 3½ h.p. geared-in-head motor engineered with positive drive
- Cutting head swivels up to 45° in either direction for angle cutting.

CAPACITY

Ferrous and non-ferrous solids up to 1½" — pipe and structurals up to 2½".



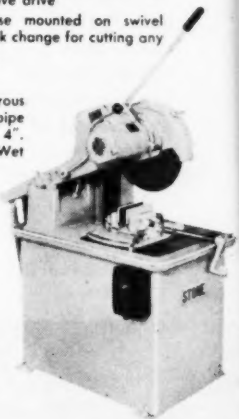
STONE Swing-Cut M16

Floor Model — Min. space required: 2½' x 4'

- Full 5 h.p. geared-in-head motor engineered with positive drive
- Self-centering vise mounted on swivel plate permits quick change for cutting any angle up to 45°.

CAPACITY

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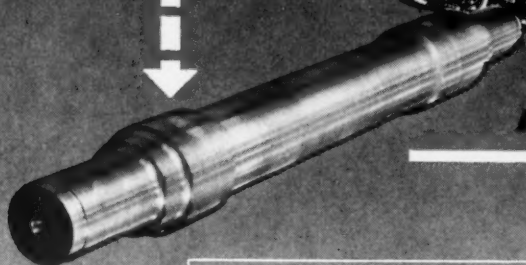
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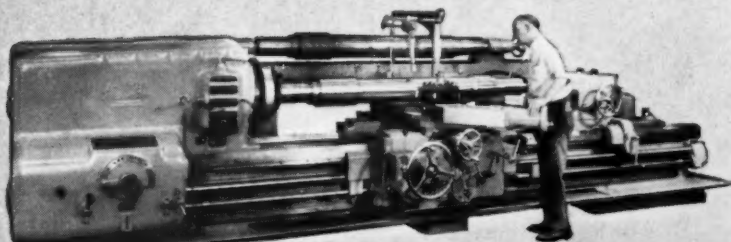
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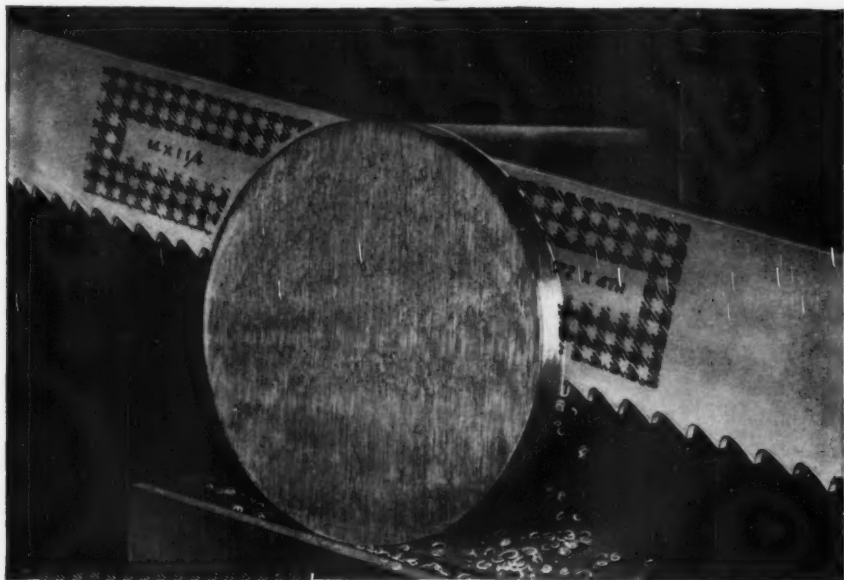
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